

Workplace Sexual Harassment Among Nursing Professionals in the Upper East Region, Ghana: Exploring the Prevalence, Determinants, and Association with Hospital Safety Culture

Charles Lwanga M Tabase

tabaselcm@yahoo.com

Nursing and Midwifery Training College-Zuarungu

Judith Adagenera

Navrongo Health Research Center

Jonathan C Tabase

University of Technology and Applied Sciences

Edward W Ansah

University of Cape Coast

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1 **Workplace Sexual Harassment Among Nursing Professionals in the Upper East Region, Ghana: Exploring the Prevalence, Determinants, and**
2 **Association with Hospital Safety Culture**

3 **Charles Lwanga M. Tabase¹, Judith Adagenera², Janathan C. Tabase³, Edward W. Ansah⁴**

4 ¹Nursing and Midwifery Training College-Zuarungu, **Bolgatanga**, Upper East Region, Ghana

5 ²Navrongo Health Research Center, **Navrongo**, Upper East Region, Ghana

6 ³University of Technology and Applied Sciences, **Navrongo**, Upper East Region, Ghana

7 ⁴Department of Health, Physical Education and Recreation, University of Cape Coast, **Cape Coast**, Ghana

8 Corresponding author:

9 Charles Lwanga M. Tabase

10 Nursing and Midwifery Training College-Zuarungu, **Bolgatanga**, Ghana

11 Email: tabase@uchc.edu or tabaselcm@yahoo.com

12 **Abstract**

13 **Background:** Sexual harassment remains a pervasive occupational hazard affecting healthcare workers, disproportionately the nursing professionals, with
14 profound professional and psychosocial consequences. Positive organizational safety culture impacts workplace safety, however, its relationship with sexual
15 harassment remains poorly understood in rural healthcare settings in low and middle-income countries. This study examines how perceived hospital safety culture
16 affects workplace sexual harassment of nursing professionals in the Upper East Region of Ghana.

17 **Methods:** A cross-sectional survey was conducted among 812 nursing professionals selected using the purposive sampling method. The survey comprised the 25-
18 item adapted Airline Safety Culture Index to measure safety culture (i.e., pathological, bureaucratic, or generative). Workplace sexual harassment and its subtypes
19 (gender harassment, unwanted sexual attention, and sexual coercion) were measured using the Sexual Experiences Questionnaire. Descriptive statistics
20 summarized participants' characteristics, and multivariable logistic regression models estimated adjusted associations between perceived safety culture and
21 workplace sexual harassment outcomes, controlling for sociodemographic and workplace characteristics.

22 **Results:** Most participants perceived their workplace safety culture as bureaucratic (63.1%), and generative (29.4%). Overall, 65.3% of the nursing professionals
23 experienced at least one form of sexual harassment while at work, like gender harassment (54.2%), unwanted sexual attention (43.7%) and sexual coercion
24 (24.5%). Compared with nursing professionals working in facilities with a generative safety culture, those in bureaucratic safety culture facilities had higher odds
25 of experiencing sexual harassment (aOR = 1.57; 95% CI: 1.08 - 2.28, p < 0.05), after adjusting for sociodemographic and workplace characteristics of the workers.
26 Working in facilities with a pathological safety culture was associated with higher odds of gender harassment (aOR = 2.03; 95% CI: 1.07 - 3.84, p = 0.029) and
27 unwanted sexual attention (aOR = 2.54; 95% CI: 1.32 - 4.98, p = 0.006).

28 **Conclusion and implication:** The high prevalence of sexual harassment and its relationship with hospital safety culture suggests that workplace sexual harassment
29 is not only an individual or interpersonal issue, but organizational safety culture also plays a critical role. Prevention requires system-level interventions where
30 healthcare leaders foster a positive, generative safety culture by visibly committing to staff safety, enforcing clear anti-harassment policies, and strengthening
31 mechanisms for confidential reporting and accountability when sexual harassment occurs.

32 **Patient or Public Contribution:** No Patient or Public Contribution.

Keywords: Hospital safety culture, sexual harassment, healthcare facilities, nursing professionals

Introduction

Nursing professionals form the majority of the healthcare workforce globally, playing a critical role in the delivery of primary healthcare (PHC) services, the achievement of universal health coverage (UHC), and the attainment of health-related Sustainable Development Goals [SDGs] [1,2]. Despite this central role, nursing professionals face several occupational health and safety challenges, including needle prick and sharps injuries, falls, exposure to infectious diseases, psychosocial stressors, workplace violence, and sexual harassment [3]. Sexual harassment represents a pervasive and systemic occupational hazard that disproportionately affects nursing professionals [4,5], but a very normally put under the radar. This occurrence, unfortunately, wears a gender cap, predominantly affecting females, and those living and working in developing countries and within rural healthcare settings [6,7].

Sexual harassment is any unwanted verbal, non-verbal, or physical conduct of a sexual nature that violates an individual's dignity, creates a hostile work environment, or is linked to explicit or implicit conditions for employment or advancement [8,9]. In behavioral research, sexual harassment is conceptually distinct in three dimensions: gender harassment, unwanted sexual attention, and sexual coercion [10]. Gender harassment refers to insulting, degrading, sexist, or hostile behaviors directed at a person because of their sex. Unwanted sexual attention includes unwelcome sexual advances, touching, comments, or repeated requests for sexual or romantic relationships. Sexual coercion involves pressure, threats, rewards, or punishment linked to sexual cooperation [10].

Workplace sexual harassment is a global occupational health concern among nursing professionals. Pooled evidence estimated a prevalence of 12.6% and a career prevalence of 53.4% [11]. Evidence from sub-Saharan Africa remains comparatively limited, but available studies show substantial variation across settings and measurement approaches. A review among female nursing professionals recorded 43.15%, with verbal, non-verbal, physical, and psychological forms commonly reported [4]. Moreover, a study among nursing professionals and nursing students in Tanzania reported 9.6% [7]. In Ghana, Bofo et al. [3] reported that 12.2% of nurses and midwives experienced workplace sexual harassment, whereas Mohammed et al. [3] reported higher estimates of 43.6% when behavior-specific questions were used and 22.6% with a direct question. These differences suggest that prevalence, including gender harassment, unwanted sexual attention, and sexual coercion, are strongly influenced by the study population, recall period, and measurement approach. Accordingly, perpetrated cut across multiple groups, including patients, patients' relatives, physicians, supervisors, and co-workers [4,7,13]. Female nursing professionals appear particularly vulnerable, especially in workplaces where reporting mechanisms are weak, management response is limited, and harassment is normalized or poorly addressed [4,13,14]. Other reported risk factors include lower professional status, being unmarried, limited work experience, shift work, and working in high-contact clinical areas, although these associations vary across settings and study designs [5,7,15].

The consequences of sexual harassment are substantial for nursing professionals, affecting physical, psychological, and social well-being [4,16]. These effects also extend to professional and organizational outcomes, including reduced job satisfaction, lower productivity, poorer perceived workplace safety, compromised care quality, absenteeism, and turnover intention [4,13,16]. In resource-constrained healthcare systems, these consequences may further weaken workforce stability and patient safety, particularly where staffing levels, supervision, and reporting systems are already limited [7].

Despite evidence on prevalence, perpetrators, and individual-level risk factors, the role of hospital safety culture in shaping workplace sexual harassment among nursing professionals remains understudied. Safety culture reflects shared organizational values, leadership commitment, openness in communication, and responsiveness to unsafe behaviors. In healthcare settings, safety culture maturity has been described along a continuum, from weak or pathological safety cultures to more developed, proactive, generative cultures, where safety is embedded in routine organizational practice [17]. Applying this lens to sexual harassment is useful because harassment is not only an interpersonal act, but also an organizational safety issue shaped by reporting systems, accountability, leadership response, and tolerance for unsafe behavior. Evidence further suggests that organizational climates with stronger psychosocial safety and associated prevention systems support reporting and reduce tolerance of workplace sexual harassment [18].

Previous studies suggest that weak organizational climates, poor reporting mechanisms, and limited management response may enable workplace sexual harassment, whereas stronger safety cultures and psychosocial safety climates may support reporting, prevention, and worker protection [18,19]. However, empirical evidence linking hospital safety culture to sexual harassment among nursing professionals remains limited, particularly in low-resource rural healthcare settings. The current study addresses this gap by examining perceived hospital safety culture, the prevalence and forms of workplace sexual harassment, and their associations among nursing professionals in the Upper East Region of Ghana. Findings may inform workplace safety policy, harassment prevention, and health workforce protection in these underserved healthcare settings.

Methods

Study design and settings

This study was a secondary analysis of data from a cross-sectional online survey conducted among nursing professionals in the Upper East Region of Ghana. The original study examined hospital safety culture, workplace sexual harassment, and turnover intention among nursing professionals in the region. The present analysis focused on workplace sexual harassment and its association with perceived hospital safety culture. The Upper East Region is located in the north-eastern part of Ghana and is predominantly rural, with dispersed settlements across districts and sub-districts [20,21]. Health services in the region are delivered through Ghana's tiered health system, which includes community-based health planning and services (CHPS), health centers, clinics, maternity homes, district and municipal hospitals, a regional hospital, and faith-based/private facilities under the oversight of the Ghana Health Service and Ministry of Health [20,22].

Study population and eligibility criteria

The study population comprised nursing professionals who work at healthcare facilities in the Upper East Region. Eligible participants included registered nurses, midwives, mental nurses, public health nurses, nurse assistants in clinical and preventive care, specialist nurses, and other nursing professionals working in regional, district/municipal, health center, clinic, and CHPS-level facilities. Participants were eligible if they had worked in a healthcare facility in the region for at least one year.

Data Source and Sampling

Data source, sampling, and survey administration

The original study intended to reach nursing professionals across healthcare facilities in the Upper East Region using a census approach. Data were collected using a structured questionnaire programmed in Google Forms and distributed via professional WhatsApp platforms of the Ghana Registered Nurses and Midwives Association and the Union of Professional Nurses and Midwives, Ghana, from May 9, 2022, to August 19, 2022. The platforms housed all the nursing professionals in the region, where they receive period information. At the time of data collection, the estimated number of nursing professionals was 3,660 [23], including those working less than a year in the region. The online approach was considered appropriate given the geographic spread of health facilities, the large number of potential respondents, and COVID-19-related restrictions on face-to-face data collection. Respondents completed the questionnaire electronically at their convenience and submitted it without any financial or material incentive. Gentle reminders were sent through nursing leaders to improve response rate. The Google Form was configured to reduce duplicate responses, and participants were instructed to complete the questionnaire only once. A total of 812 completed responses were obtained, giving a response rate of 22.2% ($812/3,660 \times 100$), and all were included in the present analysis. Despite the reported 22.2% response rate, the 812 nursing professionals were sufficiently powered to constitute the analytic sample and could represent nursing professionals in the region.

Measures

A designed questionnaire was used to collect data on perceived hospital safety culture, sexual harassment, and participants' demographic characteristics. Perceived hospital safety culture was assessed using the 25-item adapted Airline Safety Culture Index (ASCI), originally developed for aviation safety culture assessment

with high internal consistency (Cronbach's $\alpha = 0.94$) [24]. ASCI items have been adapted and psychometrically evaluated among healthcare workers in Ghana, reporting $\alpha = 0.853$ and McDonald's $\omega = 0.853$ [25]. For the present study, we changed words such as "company" and "airline" to "institution/hospital/facility" and "work area" and "employee" were amended to "ward/department" and "nurse", respectively. These changes were made to improve contextual relevance without altering the underlying safety culture construct. Items were rated on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = no idea, 4 = agree, 5 = strongly agree), with higher scores indicating a positive safety culture. Sample items included "Nurses are given enough training to do their work tasks safely", "Nurses follow safety rules almost all the time", and "Safety in this hospital is generally well controlled." Total scores ranged from 25 to 125 and were categorised into pathological/poor (25-58), bureaucratic/medium (59-92), and generative/positive safety culture (93-125) [26].

Workplace sexual harassment and its subscales, namely gender harassment, unwanted sexual attention, and sexual coercion, were assessed using the Sexual Experiences Questionnaire (SEQ), a behavior-specific instrument with high psychometric properties [10]. Fitzgerald et al. [10] reported good internal consistency for the total SEQ scale (Cronbach's $\alpha = 0.89$). Behavior-specific sexual harassment measurement using the SEQ has also been used in studies among nursing professionals in Ghana [12,27]. Responses were recorded on a 0-4 frequency scale (0 = never, 4 = most of the time), consistent with previous applications of the SEQ [27]. Experiencing sexual harassment was defined as reporting at least one item with a score > 0 . This results in a binary outcome (No = score of 0; Yes = score > 0) for overall sexual harassment and the three subscales. Internal consistency values of the ASCI, SEQ, and SEQ subscales were assessed in the current sample using Cronbach's alpha.

Covariates captured included sociodemographic and workplace variables such as age, sex, marital status, educational attainment, years of professional experience, shift pattern, and facility type.

Data Analysis

Completed online surveys were downloaded from the online platform (Google Forms) into a password-protected Microsoft Excel sheet. Data were assessed for consistency and completeness before analysis. Except for one observation that had an outrageous for which we created a missing value, all other variables included in the analysis were complete. Some participant characteristics were recoded into broader analytic categories before analysis to address sparse responses and improve stability of estimates. Categorical participant characteristics were summarised using frequencies and percentages. Continuous variables, including the ASCI safety culture score and SEQ frequency score, were assessed for normality and reported as means with standard deviations or, where data were not normally distributed, medians with interquartile ranges were calculated. The prevalence of overall workplace sexual harassment, gender harassment, unwanted sexual attention, and sexual coercion was described using frequencies and percentages.

Bivariate associations between perceived safety culture, participant characteristics, and overall workplace sexual harassment were examined using chi-square tests. Fisher's exact test was used where chi-square test assumptions were not met. Univariable and multivariable binary logistic regression models were then fitted to estimate the association between perceived hospital safety culture and workplace sexual harassment outcomes. An interaction term between safety culture and sex was included in the multivariable model for overall sexual harassment to assess whether the association differed by sex. Adjusted odds ratios (aOR), 95% confidence intervals, and p-values were reported, with statistical significance set at $p < 0.05$. All analyses were conducted using Stata version 19 (StataCorp LLC, College Station, TX, USA).

Ethical Considerations

Ethical approval for the original study was obtained from the Institutional Review Board of the University of Cape Coast (UCC/IRB/A/2016/1295) and the Navrongo Health Research Center Ethics Committee (NHRCIRB468). Administrative permissions were also obtained from relevant GHS and participating health facility authorities. In accordance with the Declaration of Helsinki, the online questionnaire included an informed consent form that explained the study purpose,

estimated time required to complete the questionnaire, voluntary participation, right to withdraw, confidentiality, anonymity, and potential risks. Only participants who provided electronic informed consent proceeded to complete the questionnaire.

Results

Characteristics of the Participants

A total of 812 nursing professionals participated in the study. Slightly more than half of the participants were aged 32 years or younger (53.4%), and the sex distribution was nearly equal (50.7% male and 49.3% female). Most respondents were married (66.6%). Nearly half worked in district or municipal facilities (46.4%) and in outpatient departments (47.7%). Table 1 presents the sociodemographic and workplace characteristics of the participants.

Table 1: Sociodemographic Characteristics of Participants (N = 812)

Predictors	Summary, n (%)
Age group	
≤ 32	434 (53.4)
33+	378 (46.6)
Sex	
Male	412 (50.7)
Female	400 (49.3)
Marital Status	
Not currently married ¹	271 (33.4)
Married ²	540 (66.6)
Educational Attainment	
Bachelor's and above ³	254 (31.3)
Diploma	378 (46.5)
Certificate	180 (22.2)
Years of Experience	
1-5	368 (45.3)
6-10	301 (37.1)
11+	143 (17.6)
Work Shift	
Day or Night only	356 (43.8)
Day and Night	456 (56.2)
Facility Type	
CHPS ⁴	52 (6.4)
Health Center/Clinic ⁵	231 (28.4)
District/Municipal ⁶	377 (46.5)
Regional Hospital	152 (18.7)
Department	
Outpatient department (OPD) ⁷	387 (47.7)
In-patient ⁸	317 (39.0)
Specialized/Procedural ⁹	108 (13.3)

Table 2 presents the distribution of perceived organizational safety culture and the overall prevalence of workplace sexual harassment and by its subscales. Most participants perceived their workplace safety culture as bureaucratic/medium (63.1%), while 29.4% reported a generative/positive culture and 7.5% reported pathological/poor culture. Overall, 65.3% of respondents reported experiencing at least one form of workplace sexual harassment while on duty. Gender harassment was the most common subtype (54.2%), followed by unwanted sexual attention (43.7%) and sexual coercion (24.5%). Moreover, the instruments demonstrated high internal consistency for safety culture scale (0.92) and the overall sexual harassment scale (0.92) (see Table 2).

Table 2: Distribution of Safety Culture, Sexual Harassment, and Subscales Among Participants (N=812)

¹ Not currently married includes single, separated, widowed and divorced.
² Married includes married and living with the partner, married but not living with the partner, and co-habitation.
³ Bachelor’s degree or higher includes bachelor’s, master’s, doctoral qualification.
⁴ Community-based health planning and services (CHPS) includes all localized primary health care facilities in rural and underserved communities in the Upper East region that provide services such as minor ailment treatment, vaccination, and maternal care. care.
⁵ Health center/clinics include all facilities in the catchment area within the Upper East region with population of approximately 20000 people that provides basic preventive, curative and reproductive health services at the community level.
⁶ District/Municipal includes Bawku municipal, Bawku West district, Bongo district, Builsa North municipal, and Kassena Nankana municipal, Kassena Nankana West district, and Talensi district hospitals.
⁷ Out-patient department (OPD) includes OPD, public health, reproductive and child health unit and CHPS facilities.
⁸ In-patient include medical, surgical, general, pediatric, obstetric and gynecological, labor and emergency wards.
⁹ Specialized/Procedural include theatres, eye unit, intensive care unit, dental unit and ear, nose and throat units

Variables	Summary, n (%)	Reliability Coefficient Cronbach Alpha (α)
Perceived Safety Culture		
Pathological/Poor	61 (7.5)	0.92
Bureaucratic/Medium	512 (63.1)	
Generative/Positive	239 (29.4)	
Experienced Sexual Harassment		
No	282 (34.7)	0.92
Yes	530 (65.3)	
Experienced Gender Harassment		
No	372 (45.8)	0.79
Yes	440 (54.2)	
Experienced Unwanted Sexual Attention		
No	457 (56.3)	0.87
Yes	355 (43.7)	
Experienced Sexual Coercion		
No	613 (75.5)	0.83
Yes	199 (24.5)	

1

2 Table 3 shows that marital status, educational attainment, shift pattern, and department were significantly associated with experiencing sexual harassment. Among
3 respondents who experienced sexual harassment, higher proportions were married (63.8%; $p = 0.020$), diploma holders (52.6%; $p < 0.001$), worked both day and
4 night shifts (60.4%; $p < 0.001$), and worked in OPD (52.1%; $p < 0.001$). Age group, gender, years of experience, and type of facility were not significantly
5 associated with sexual harassment.

6 *Table 3: Association between sexual harassment and characteristics of participants (N=812)*

Variables	Experienced Sexual Harassment		Chi-squared Test
	No	Yes	P-value
	(n = 282)	(n = 530)	
Age Group			
32 and below	146 (51.8)	288 (54.3)	0.485
33 and above	136 (48.2)	242 (45.7)	
Gender			
Male	134 (47.5)	278 (52.5)	0.180
Female	148 (52.5)	252 (47.5)	
Marital Status			
Not currently married ¹⁰	79 (28.1)	192 (36.2)	0.020
Married ¹¹	202 (71.9)	338 (63.8)	
Educational Attainment			
Bachelor's and above ¹²	165 (58.5)	89 (16.8)	<0.001
Diploma	99 (35.1)	279 (52.6)	
Certificate	18 (6.4)	162 (30.6)	
Years of Experience			
1-5	130 (46.1)	238 (44.9)	0.929
6-10	104 (36.9)	197 (37.2)	
11 +	48 (17.0)	95 (17.9)	
Shift			
Day/Night only	146 (51.8)	210 (39.6)	<0.001
Day and Night	136 (48.2)	320 (60.4)	
Type of Facility			
CHPS ¹³	17 (6.0)	35 (6.6)	0.649
Health Center/Clinic ¹⁴	87 (30.9)	144 (27.2)	
District/Municipal ¹⁵	130 (46.1)	247 (46.6)	
Regional Hospital	48 (17.0)	104 (19.6)	

¹⁰ Not currently married includes single, separated, widowed and divorced.

¹¹ Married includes married and living with the partner, married but not living with the partner, and co-habitation.

¹² Bachelor's degree or higher includes bachelor's, master's, doctoral qualification.

¹³ Community-based health planning and services (CHPS) includes all localized primary health care facilities in rural and underserved communities in the Upper East region that provide services such as minor ailment treatment, vaccination, and maternal care. care.

¹⁴ Health center/clinics include all facilities in the catchment area within the Upper East region with population of approximately 20000 people that provides basic preventive, curative and reproductive health services at the community level.

¹⁵ District/Municipal includes Bawku municipal, Bawku West district, Bongo district, Builsa North municipal, and Kassena Nankana municipal, Kassena Nankana West district, and Talensi district hospitals.

Department				1
OPD ¹⁶	111 (39.4)	276 (52.1)	0.001	
In Patient ¹⁷	132 (46.8)	185 (34.9)		
Specialized/Procedural ¹⁸	39 (13.8)	69 (13.0)		2
Safety Culture				3
Pathological/poor	19 (6.7)	42 (7.9)	0.147	
Bureaucratic/medium	168 (59.6)	344 (64.9)		4
Generative/Positive	95 (33.7)	144 (27.2)		
				5

Table 4 shows that perceived safety culture was not significantly associated with overall sexual harassment or any of its subscales at the 5% significance level. However, the proportions of overall sexual harassment, gender harassment, and unwanted sexual attention were generally higher among respondents who perceived their workplace safety culture as pathological. Model diagnostics indicated acceptable model fit across all four multivariable logistic regression models. The omnibus tests were statistically significant for all models ($p < 0.001$), while the Hosmer-Lemeshow tests were non-significant, suggesting no evidence of poor model fit. Also, the Nagelkerke R^2 values ranged from 18.5% to 31.6%, indicating a modest explanatory power across the models.

Table 4: Association between perceived hospital safety culture and sexual harassment outcomes (N=812)

Outcome	Perceived Hospital Safety Culture			Chi-squared Test
	Pathological (n = 61)	Bureaucratic (n = 512)	Generative (n = 239)	P-value
Experienced Sexual Harassment				
No	19 (31.1)	168 (32.8)	95 (39.7)	0.147
Yes	42 (68.9)	344 (67.2)	144 (60.3)	
Experienced Gender Harassment				
No	22 (36.1)	230 (44.9)	120 (50.2)	0.113
Yes	39 (63.9)	282 (55.1)	119 (49.8)	
Experienced Unwanted Sexual Attention				
No	27 (44.3)	284 (55.5)	146 (61.1)	0.051
Yes	34 (55.7)	228 (44.5)	93 (38.9)	
Experienced Sexual Coercion				
No	46 (75.4)	390 (76.2)	177 (74.1)	0.821
Yes	15 (24.6)	122 (23.8)	62 (25.9)	

Predictors of Overall Sexual Harassment, Gender Harassment, Unwanted Sexual Attention, and Sexual Coercion

Table 5 presents the results of the multivariable logistic regression models. Respondents who perceived their workplace safety culture as bureaucratic (aOR = 1.57, 95% CI: 1.08-2.28) had higher odds of reporting sexual harassment compared with those reporting generative/positive safety culture. Diploma holders (aOR = 5.62, 95% CI: 3.91-8.09) and certificate holders (aOR = 18.13, 95% CI: 10.22-32.13) had higher odds of experiencing sexual harassment compared with bachelor's degree or higher degree holders. Working both day and night shifts was also associated with higher odds of sexual harassment (aOR = 1.64, 95% CI: 1.15–2.33). In contrast, being married (aOR = 0.56, 95% CI: 0.38-0.84), having 1-5 years of working experience (aOR = 0.39, 95% CI: 0.19-0.77), working in a health centre/clinic (aOR = 0.64, 95% CI: 0.42-0.98), in-patient department (aOR = 0.48, 95% CI: 0.32-0.73), or specialised/procedural department (aOR = 0.57, 95% CI: 0.33-1.00) were associated with lower odds of reporting overall sexual harassment.

Workers who reported gender harassment also reported higher odds of pathological safety culture compared with generative/positive safety culture (aOR = 2.03, 95% CI: 1.07-3.84). Diploma holders (aOR = 3.02, 95% CI: 2.14-4.27) and certificate holders (aOR = 6.96, 95% CI: 4.44-10.88) also had higher odds of gender harassment compared with bachelor's or higher degree holder. Conversely, being married (aOR = 0.53, 95% CI: 0.37-0.75), having 1-5 (aOR = 0.34, 95% CI: 0.18-0.63) or 6-10 years of working experience (aOR = 0.53, 95% CI: 0.33-0.85), and working in an in-patient department (aOR = 0.69, 95% CI: 0.48-0.99) were associated with lower odds of gender harassment.

¹⁶ OPD includes out-patient department (OPD), public health, reproductive and child health unit and CHPS facilities.

¹⁷ In-patient include medical, surgical, general, pediatric, obstetric and gynecological, labor and emergency wards.

¹⁸ Specialized/Procedural include theatres, eye unit, intensive care unit, dental unit and ear, nose and throat units.

1 Pathological safety culture (aOR = 2.56, 95% CI: 1.32-4.98) was associated with higher odds of unwanted sexual attention compared with generative/positive
2 safety culture. Diploma holders (aOR = 6.42, 95% CI: 4.23-9.76), certificate holders (aOR = 14.24, 95% CI: 8.69-23.32), and working both day and night shifts
3 (aOR = 1.86, 95% CI: 1.32-2.61) had higher odds of unwanted sexual attention. Lower odds were observed among married workers (aOR = 0.51, 95% CI: 0.35-
4 0.74), those with 1-5 (aOR = 0.32, 95% CI: 0.16-0.62) or 6-10 years of working experience (aOR = 0.55, 95% CI: 0.33-0.89), those working in health centres/clinics
5 (aOR = 0.61, 95% CI: 0.41-0.92), and those in in-patient departments (aOR = 0.48, 95% CI: 0.33-0.71).

6 Perceived safety culture was not significantly associated with the outcome sexual coercion. But females (aOR = 1.60, 95% CI: 1.11-2.32) had higher odds of
7 sexual coercion than the males. Diploma holders (aOR = 8.29, 95% CI: 4.49-15.30) and certificate holders (aOR = 12.00, 95% CI: 6.28-22.92) also had higher
8 odds compared with bachelor's degree or higher degree holders. Working both day and night shifts was associated with higher odds of sexual coercion (aOR =
9 1.57, 95% CI: 1.07-2.30), while working in an in-patient department was associated with lower odds (aOR = 0.38, 95% CI: 0.24-0.59).

10 Across the four models, lower educational attainment was the most consistent predictor of higher odds of sexual harassment outcomes. Day-and-night shift work
11 was also associated with increased odds in most models. In contrast, being married, having fewer years of working experience, and working in in-patient
12 departments were generally associated with lower propensity of reporting sexual harassment at work. Perceived safety culture showed outcome-specific effects,
13 with bureaucratic culture associated with overall sexual harassment and pathological culture associated with gender harassment and unwanted sexual attention.

14 *Table 5: Factors associated with sexual harassment outcomes among nursing professionals estimated by multivariable logistic models*

Predictor	Sexual Harassment aOR ¹⁹ (95% CI ²⁰)	Gender Harassment aOR (95% CI)	Unwanted Sexual Attention aOR (95% CI)	Sexual Coercion aOR (95% CI)
Perceived Safety Culture				
Pathological	1.74 (0.86-3.53)	2.03 (1.07-3.84) * ²²	2.56 (1.32-4.98) ** ²³	1.03 (0.50-2.12)
Bureaucratic	1.57 (1.08-2.28) *	1.31 (0.94-1.83)	1.43 (1.00-2.05)	0.94 (0.64-1.39)
Generative / Positive	Ref ²¹	Ref	Ref	Ref
Age group				
≤32 years	Ref	Ref	Ref	Ref
≥33 years	0.68 (0.40-1.15)	0.80 (0.50-1.28)	0.73 (0.44-1.20)	1.18 (0.68-2.05)
Sex				
Male	Ref	Ref	Ref	Ref
Female	0.82 (0.58-1.16)	0.91 (0.67-1.25)	1.37 (0.98-1.91)	1.60 (1.11-2.32) *
Marital Status				
Not currently married ²⁴	Ref	Ref	Ref	Ref
Married ²⁵	0.56 (0.38-0.84) **	0.53 (0.37-0.75) **	0.51 (0.35-0.74) **	0.67 (0.45-1.00)
Years of Work Experience				
1-5 years	0.39 (0.19-0.77) *	0.34 (0.18-0.63) **	0.32 (0.16-0.62) **	0.89 (0.43-1.83)
6-10 years	0.60 (0.36-1.00)	0.53 (0.33-0.85) *	0.55 (0.33-0.89) *	0.76 (0.44-1.32)
≥11 years	Ref	Ref	Ref	Ref
Educational Attainment				
Bachelor's and above ²⁶	Ref	Ref	Ref	Ref
Diploma	5.62 (3.91-8.09) **	3.02 (2.14-4.27) **	6.42 (4.23-9.76) **	8.29 (4.49-15.30) **
Certificate	18.13 (10.22-32.13) **	6.96 (4.44-10.88) **	14.24 (8.69-23.32) **	12.00 (6.28-22.92) **
Work Shift				
Day or Night only	Ref	Ref	Ref	Ref
Day and Night	1.64 (1.15-2.33) **	1.12 (0.82-1.54)	1.86 (1.32-2.61) **	1.57 (1.07-2.30) *

¹⁹ aOR, adjusted odds ratio.

²⁰ CI, confidence interval.

²¹ Ref, reference

²² *, p < 0.05

²³ **, p < 0.001

²⁴ Not currently married includes single, separated, widowed and divorced.

²⁵ Married includes married and living with the partner, married but not living with the partner, and co-habitation.

²⁶ Bachelor's degree or higher includes bachelor's, master's, doctoral qualification.

Facility type					
CHPS ²⁷	0.77 (0.37-1.58)	0.87 (0.46-1.65)	0.72 (0.37-1.43)	0.54 (0.25-1.18)	
Health Center/Clinic ²⁸	0.64 (0.42-0.98) *	0.84 (0.58-1.23)	0.61 (0.41-0.92) *	0.72 (0.46-1.11)	
District/Municipal ²⁹	Ref	Ref	Ref	Ref	
Regional Hospital	1.00 (0.62-1.60)	1.02 (0.67-1.54)	0.80 (0.52-1.24)	0.94 (0.58-1.53)	
Department					
OPD ³⁰	Ref	Ref	Ref	Ref	
In Patient ³¹	0.48 (0.32-0.73) **	0.69 (0.48-0.99) *	0.48 (0.33-0.71) **	0.38 (0.24-0.59) **	
Specialized/Procedural ³²	0.57 (0.33-1.00) *	0.71 (0.43-1.16)	0.60 (0.35-1.01)	1.17 (0.69-1.98)	
Model Diagnostics					
Cox and Snell (R ²)	0.229	0.138	0.230	0.161	
Nagelkerke (R ²)	0.316	0.185	0.308	0.240	
Omnibus χ^2 (df), <i>p</i> -value	211.116, <i>p</i> < 0.001	120.759, <i>p</i> < 0.001	211.564, <i>p</i> < 0.001	142.588, <i>p</i> < 0.001	
Hosmer & Lemeshow χ^2 (df), <i>p</i> -value	4.00, <i>p</i> = 0.8570	8.96, <i>p</i> = 0.346	2.89, <i>p</i> = 0.941	7.92, <i>p</i> = 0.441	

Discussion

This study found that most of the nursing professionals perceived their workplace safety culture as suboptimal, with the majority reporting a bureaucratic/medium safety culture. Nearly two-thirds of these workers reported experiencing at least one form of workplace sexual harassment in the year preceding data collection. Gender harassment was the most common form, followed by unwanted sexual attention and sexual coercion. Perceived safety culture showed outcome-specific associations, where bureaucratic safety culture was associated with higher odds of overall sexual harassment, while pathological safety culture was associated with higher odds of gender harassment and unwanted sexual attention. Lower educational attainment was the most consistently associated with all the sexual harassment outcomes, while working both day and night shifts was associated with higher odds of overall sexual harassment, unwanted sexual attention, and sexual coercion. In contrast, being married and working at in-patient departments were associated with lower odds. Moreover, age, facility type, and years of working experience did not show consistent associations across all models. Overall, these findings suggest that workplace sexual harassment among nursing professionals may be shaped less by individual demographic characteristics alone, but more by structural power relations, work organization, and weakly embedded workplace safety norms.

Distribution of perceived hospital safety culture

Nearly two-thirds of nursing professionals perceived their workplace safety culture as bureaucratic/medium. The suggestion is that safety practices may be driven more by rules, procedures, and documentation rather than by proactive and shared safety culture at these healthcare facilities. This finding is important in resource-constrained settings like the northern Ghana, where weak safety norms could undermine care quality, increase workplace psychological risks, and contribute to nursing professionals' attrition. Similar concerns have been reported in Ghana and other African healthcare settings, where safety culture scores are often modest that reflect gaps in staffing, reporting systems, leadership support for worker safety, and non-punitive learning environments [28,29]. The predominance of bureaucratic culture indicates that some safety structures exist, but these need to shift towards a more generative culture that is built on leadership commitment, open communication, learning, and continuous improvement at the facility level. Such a shift may help reduce workplace hazards, including sexual harassment, while improving nurse retention and patient safety outcomes [19,30].

Prevalence of sexual harassment

The burden of workplace sexual harassment observed in this study was substantial, with nearly two-thirds of nursing professionals reporting at least one form of harassment in the year preceding data collection. This prevalence (65.3%) is by far higher than the pooled global annual estimate of 12.6% reported [31] in meta-

²⁷ Community-based health planning and services (CHPS) includes all localized primary health care facilities in rural and underserved communities in the Upper East region that provide services such as minor ailment treatment, vaccination, and maternal care. care.

²⁸ Health center/clinics include all facilities in the catchment area within the Upper East region with population of approximately 20000 people that provides basic preventive, curative and reproductive health services at the community level.

²⁹ District/Municipal includes Bawku municipal, Bawku West district, Bongo district, Builsa North municipal, and Kassena Nankana municipal, Kassena Nankana West district, and Talensi district hospitals.

³⁰ OPD includes out-patient department (OPD), public health, reproductive and child health unit and CHPS facilities.

³¹ In-patient include medical, surgical, general, pediatric, obstetric and gynecological, labor and emergency wards.

³² Specialized/Procedural include theatres, eye unit, intensive care unit, dental unit and ear, nose and throat units.

analysis. Across low- and middle-income settings, reported prevalence varies widely depending on occupational context, study population, recall period, and measurement approach. For example, there were reported prevalence of 9.6% to 10.5% among nursing professionals and nursing students in Tanzania [7], while studies among hospital-based nursing professionals in Ethiopia have reported estimates ranging from 17.4% to 46.6% [6,14]. In Ghana, Mohammed et al. [12] showed that prevalence differ by measurement approach, reporting 43.6% using behavior-based questions compared with 22.6% when using a direct question. This supports the need to interpret prevalence in relation to the instruments, definitions, and recall periods used.

Gender harassment was the common form of harassment reported by the workers in this study, followed by unwanted sexual attention and sexual coercion. This pattern is consistent with evidence suggesting that sexist remarks, gender-based hostility, and derogatory behaviors may be more commonly reported in healthcare settings [4,7,14]. Although sexual coercion was the least common form, its occurrence among about one-quarter of these workers is concerning because of its potential effects on psychological well-being, professional engagement, workplace safety culture, and quality of care [6,11]. These findings have direct implications for Sustainable Development Goal 3 (SDG 3), particularly the need to ensure safe, supportive, and associated high-quality healthcare environments. They also underscore the need for stronger institutional responses, including clear reporting pathways, visible leadership commitment, non-retaliatory complaint systems, and enforcement of zero-tolerance policies sexual harassment, this aim is to protect nursing professionals.

Predictors of sexual harassment outcomes

Perceived safety culture was associated with specific sexual harassment outcomes in this study. Nursing professionals who perceived their facilities as having a pathological safety culture had higher odds of reporting gender harassment and unwanted sexual attention, while those reporting a bureaucratic safety culture had higher odds of overall sexual harassment. This suggests that workplace environments characterized by weak safety norms, limited openness, and compliance-driven systems may create conditions in which harassment is tolerated, underreported, or poorly addressed. Conversely, generative safety cultures, which emphasize leadership commitment, open communication, learning, and accountability, may offer stronger protection against workplace mistreatment [19].

Lower educational attainment was the most consistent predictor across all sexual harassment outcomes. Nursing professionals with diploma or certificate qualifications had higher odds of reporting overall sexual harassment, gender harassment, unwanted sexual attention, and sexual coercion. This finding is consistent with studies from Ghana and Ethiopia, where lower-cadre nursing professionals were more vulnerable to sexual harassment [3,12,14]. Perhaps, these category of workers have reduced professional autonomy, weaker bargaining power, greater exposure to supervisory hierarchies and have high fear of securing another job in case of victimisation. Most of these workers are also likely to be young and casual workers whose tenure is not assured, for which they lack the authority to resist harassment and or report such occurrence.

Marital status and work experience showed protective patterns for some harassment outcomes. Married nursing professionals had lower odds of overall sexual harassment, gender harassment, and unwanted sexual attention, while more experienced nursing professionals were less likely to experience harassment. Similar patterns have been reported in Ghana and other sub-Saharan African settings, where younger, unmarried, and less experienced nursing professionals appear more vulnerable to workplace sexual harassment [3,12,14]. Marriage may confer perceived social protection in conservative settings, while professional experience may improve confidence, social capital, and knowledge of workplace reporting channels. For instance, in conservative patriarchal northern region of Ghana, perpetrators of sexual harassment may respect older workers or see married female workers as culturally and socially unattachable.

Nursing professionals working both day and night shifts had higher odds of overall sexual harassment, unwanted sexual attention, and sexual coercion. This may reflect increased cumulative exposure to patients and their relatives, colleagues, and supervisors across different work periods, including periods when staffing levels and supervision may be reduced. While the mechanisms may vary by setting, shift work and extended working hours have been identified as important work-related conditions that increase nursing professionals' vulnerability to workplace violence and harassment [31]. This could affect some departments more than others. Nursing professionals working in in-patient departments had lower odds of sexual harassment compared with those in outpatient departments. This

1 may reflect the relatively high patient turnover, crowding, limited privacy, and frequent public interaction in outpatient settings, which can increase opportunities
2 for inappropriate comments, boundary violations, and harassment. Moreover, in-patient department brings patients and their relatives closer and more extended
3 stay with healthcare workers, situations that could create environment for sexual harassment. Similar concerns have been reported in studies from Tanzania and
4 Ethiopia, where outpatient and high-contact clinical areas were linked to increased risk of harassment [6,7].

5 Female nursing professionals had higher odds of sexual coercion than male nursing professionals, although sex was not consistently associated with the other
6 harassment outcomes. This finding is consistent with evidence showing that females in healthcare settings remain particularly vulnerable to severe forms of sexual
7 harassment and sexual violence, especially where gendered power relations and hierarchical workplace structures are strong [12,32].

8 Overall, the findings show that workplace sexual harassment among nursing professionals is not only an individual-level problem, but also an organizational issue
9 shaped by educational hierarchy, work schedules, departmental exposure, gendered power relations, and safety culture. Interventions should therefore, go beyond
10 individual awareness creation to include stronger reporting systems, leadership accountability, non-retaliatory complaint mechanisms, and enforcement of zero-
11 tolerance policies within these healthcare facilities.

12 **Strengths and limitations**

13 This study has several strengths. It used a relatively large sample of nursing professionals and applied a behavior-based measure of sexual harassment, which may
14 capture a wider range of harassment experiences than single-item or direct-question approach. The inclusion of both individual-level and organizational factors,
15 including shift pattern and perceived hospital safety culture, also provides a broader understanding of the conditions associated with workplace sexual harassment
16 among these nursing professionals. However, the cross-sectional design limits causal interpretation, and the use of self-reported data may have introduced recall
17 and social desirability bias, particularly because sexual harassment is a sensitive subject in the northern Ghana and may be underreported. Although the study
18 included a sizeable analytic sample, the voluntary online survey approach limits the claim of representativeness and generalisability to all nursing professionals in
19 the region. The online survey approach, distributed mainly through WhatsApp platforms, may have introduced digital access bias by excluding nursing
20 professionals without smartphones, reliable internet access, active platform participation, or adequate digital literacy. This may have skewed the sample towards
21 younger, more urban, and digitally connected nursing professionals. In addition, perceived safety culture may not fully capture all organizational dynamics that
22 shape sexual harassment, and the pseudo- R^2 values suggest that other unmeasured interpersonal, workplace, and institutional factors may also contribute to sexual
23 harassment outcomes. The single-region setting may limit transferability to other contexts in Ghana. Future studies should examine whether strengthening
24 organizational systems, reporting mechanisms, and safety culture can reduce workplace sexual harassment and improve nursing professionals' well-being,
25 workforce retention, and patient safety outcomes.

26 **Conclusions**

27 This study highlights workplace sexual harassment as a high prevalent occupational challenge among nursing professionals in the Upper East Region of Ghana.
28 This hazard is primarily shaped by personal, structural and organizational factors, such as the educational cadre, work experience, work shift patterns, and the
29 safety culture of the facilities. Addressing sexual harassment requires system-level responses rather than individual-focused approaches. Healthcare institutions
30 should implement and enforce clear sexual harassment policies, strengthen mechanisms for confidential reporting and accountability, and integrate harassment
31 prevention into routine occupational health and safety management in the region. Targeted protections for lower-cadre nursing professionals and those working
32 extended or rotating shifts are particularly important. Embedding these measures within healthcare quality and workforce safety frameworks may promote safer
33 and more respectful healthcare environments that promote worker safety and quality care delivery in the region.

1 **Declarations**

2 **Authors' contributions:** CLMT and EWA conceptualized and designed the study. CLMT collected the data. CLMT and EWA drafted the manuscript. EWA
3 undertook a critical review of the manuscript. JA carried out data management, statistical analysis, methodology, and results writing. JCT contributed to drafting
4 the introduction and discussion sections. All authors critically reviewed and approved the manuscript for publication in its current form. CLMT is the guarantor,
5 with overall responsibility for the management and integrity of the study.

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7 **Availability of data:** The dataset is available on reasonable request.

8 **Clinical trial registration:** Not applicable.

9 **Ethics approval and consent to participate:** Ethical approval was granted by the University of Cape Coast Institutional Review Board (ID:
10 UCC/IRB/A/2016/1295) and the Navrongo Health Research Center Ethics Committee (ID: NHRCIRB468). Administrative permission was obtained from the
11 regional, municipal/district directorates of the Ghana Health Service, the Christian Health Association of Ghana (CHAG), and the management of participating
12 health facilities. All participants provided informed consent prior to participation. Participation was voluntary, and anonymity and confidentiality were strictly
13 maintained throughout the study. The study adhered to the ethical principles of the Declaration of Helsinki for medical research involving human participants.

14 **Competing interests:** None declared

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- 17

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- [Table1SociodemographicCharacteristicsofParticipants.docx](#)
- [Table3Associationbetweensexualharassmentandcharacteristicsofparticipants.docx](#)
- [Table4Associationbetweenperceivedhospitalsafetycultureandsexualharassmentoutcomes.docx](#)
- [Table5Factorsassociatedwithsexualharassmentoutcomesamongnursingprofessionalsestimated.docx](#)
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