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*Original Article*

# Evaluating occupational health and safety conditions among security guards in a Ghanaian Public University

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## ABSTRACT

**Introduction:** The occupational health and safety (OHS) issues at academic institutions have received little attention, especially regarding the security staff who face specific job-related risks. This study examines the safety climate, risk exposures, and occupational health and safety (OHS) policies among security guards at the University of Cape Coast, Ghana.

**Methods:** A cross-sectional study was conducted from July to October 2023, employing both quantitative and qualitative approaches. Structured questionnaires, including the validated NOSACQ-50 tool, observational checklists, and expert-led risk assessments, were used in data collection. The study comprised 162 security guards with a minimum of one year of experience. The relationship between knowledge, attitudes, and safety outcomes was evaluated using descriptive statistics, chi-square tests, and correlation analyses.

**Results:** With a mean score of 2.25 ± 0.17, the general safety climate was judged to be low; management's safety commitment and communication received especially low ratings. Among the main occupational hazards were psychological risks (67.8%), environmental exposures (76.2%), and ergonomic stresses (87.7%). Among the frequently mentioned health issues were occupational stress (86.4%) and low back pain (74.0%). Only 23.5% of participants regularly reported exposures; hence, reporting of occupational injuries was less than ideal. High-risk areas identified by risk assessments as needing immediate mitigation included musculoskeletal injuries, stress, and insect bites.

**Conclusion:** Overall, the study reveals notable shortcomings in the OHS infrastructure and security environment for Ghanaian university staff. To ensure a safer workplace for security personnel, effective training, managerial commitment, policy implementation, and risk-reduction techniques are urgently needed.

**Keywords:** risk assessment, safety climate, security guards, university campus

## Introduction

Occupational health and safety (OHS) is a vital concern across various industries globally, focusing on safeguarding employees' health, safety, and welfare. In Ghana, the importance of OHS has increased due to a heightened awareness of the risks associated with different professions and the necessity for safe working environments. While much of the research in Ghana has centered on sectors like mining, manufacturing, and healthcare, there has been limited focus on the occupational health and safety of security guards, especially in academic institutions. Security guards play a crucial role in ensuring the safety and functionality of university campuses. Yet, they encounter unique occupational hazards that can impact both their physical health and mental well-being. Prior studies that have involved security personnel highlight musculoskeletal

diseases,[1,2] fatigue, depression, and sleep disorders,[3] as the leading health problems among them. In research on security guards in Serbia, work-related stress was found to be associated with several medical conditions, including high blood pressure, diabetes, and syndrome X.[4] Limited research has been undertaken on the health and safety of security personnel within colleges and universities. A review of the available literature revealed a few such studies. A study from South Africa indicated that the rotational shifts impacted some aspects of the lives of campus security officers.[5] The respondents reported disrupted family relationships and insomnia. A different study with campus safety officers in Brazil found that the work capacity index had significantly high levels of association between social support in the work environment and depression levels.[6] In university settings, security guards often face high-risk situations, such as dealing with physical confrontations, enduring long working hours, working night shifts, and adapting to varying environmental conditions. These factors can contribute to stress, fatigue, and health issues, affecting their job performance and overall health. Despite their essential role in maintaining campus safety, there is frequently a lack of comprehensive OHS measures designed to meet their specific needs, leaving them at risk for occupational injuries and illnesses. As student populations grow and campuses expand in Ghanaian universities, the demand for security personnel has also increased.[7] However, limited resources and the lack of standardized OHS policies for university security staff mean that many guards operate without sufficient protection or support.[7] This highlights the urgent need for focused research on the health and safety conditions experienced by security guards in these environments. Even though a few studies have been conducted in Ghana to explore safety on campuses,[7,8] none have investigated the knowledge, practices, and attitudes of campus security guards on occupational health and safety (OHS). Such research is crucial for informing policymakers and university administrators about the specific OHS requirements of security guards, which can help shape effective interventions to enhance their safety and well-being. Understanding people's perceptions of safety and the identification of areas for improvement in the workplace depend on an awareness of the safety atmosphere that exists at the workplace. Different tools have been developed and used in many different fields to evaluate the safety situation. These cover the Psychosocial Safety Climate (PSC) Scale, Safety Climate Assessment Tool (S-CAT), Safety Climate Tool (SCT), and the General Health Questionnaire (GHQ-12).[9–12] Utilizing organizational and safety climate theories, psychological theories, past empirical research, global empirical findings, and a continuous development process, a collaboration of Nordic Occupational Safety Experts created the Nordic Safety Climate Questionnaire (NOSACQ-50) in 2011.[13] The NOSACQ-50 evaluates seven important aspects of safety environment including collective safety standards, safety communication, and management's dedication to safety. This all-encompassing approach helps one to fully understand the elements influencing safety behaviors, which is necessary to identify areas for improvement in the security service on university campuses.

This study, therefore, employed the NOSACQ-50 tool among other tools to assess the safety climate among security guards at the University of Cape Coast, a Ghanaian public university, exploring the nature and extent of the hazards they face, the adequacy of existing safety measures, and the impact of these factors on their health and job performance. By focusing on this under-researched group, the study seeks to contribute to the knowledge on OHS in Ghana by evaluating the occupational health and safety (OHS) conditions, risk exposures, and safety climate among security guards at the University of Cape Coast, Ghana.

## Methods

The survey was conducted among the security personnel of the University of Cape Coast, a public university in Cape Coast, Ghana. This cross-sectional study used triangulation of methodologies. Its hazard identification was carried out using an observational checklist to inspect the workplace and a questionnaire to gather the opinions of security personnel on what constituted risks in the workplace. The NOSACQ-50 tool was used to assess the safety climate among the security guards. The study was carried out from July 2023 to October 2023. The study population consisted of all security staff who had worked at the University of Cape Coast for a minimum of one year. The total count of security personnel was 200, per records acquired from the Human Resource Directorate of the University. Per the eligibility criteria, 182 qualified to be included in the study, with 18 disqualified because they had worked with the University for less than one year. Using the census technique, all those who qualified were invited to join the study. The means and standard deviations were utilized to summarize continuous variables. The t-test was employed to conduct a comparative analysis between the groups. The categorical variables were summarized using their frequencies and percentages. The relationship between the independent and dependent variables was estimated using chi-square analysis. Data processing was conducted using software programs compatible with SPSS version 22. Statistical significance was determined at 5% and within the 95% Confidence Intervals. This research employed a structured self-administered questionnaire, and a pilot study was performed with ten security staff members from Cape Coast Technical University to verify its validity. This facilitated essential modifications to the questionnaire; also, the insights of specialists in occupational health were solicited during the development of the questionnaire and observational checklist. The reliability was improved by comparing the evaluation scores of three independent experts for identical hazards.

The survey comprised six sections: Section A collected data on the sociodemographic characteristics of respondents, while Section B gathered information on their awareness, knowledge, and practices related to occupational health and safety. The participants' perceptions of risks and the implementation of workplace health and safety were evaluated in Section C. Section D assessed the employees' self-reported exposure to occupational hazards. Section F examined the impact of occupational hazards on staff in the preceding year, whereas Section E was utilized to collect data on accessible workplace hazard mitigation strategies.

After examining earlier comparable research, [7,8,14] an observational checklist was created. It had eight parts. Sections on first aid, OHS rules, PPE use by employees, electrical safety, fire safety, general security, and availability of PPEs were among those covered. The study used the NOSACQ-50 tool to assess the safety climate among security workers at the University of Cape Coast. The findings were interpreted according to the author's guidelines as follows: a score of more than 3.30 (good level), 3.00 -3.3. (fairly good), 2.70-2.99 (fairly low), and less than 2.70 (low level). [15] A validated risk assessment matrix from a prior investigations[16,17] was used and modified to account for the risks found. Three experts utilized the form to assess the risks associated with the hazards identified during the risk identification procedures.

The Risk score (R) was determined by multiplying the probability of the event (P) by the severity of the event (S). The risk scores were defined as follows: inconsequential risk (1), tolerable/low risk (2, 3, 4, 5, and 6), moderate/medium risk (8, 9, 10, and 12), significant/high risk (15, 16, and 20), and intolerable risk (25). The University of Cape Coast Ethical Review Board approved the study protocol and issued an ethical clearance ID (UCC/IRB/EXT/2023/13).

Informed consent in writing was obtained from every participant. To maintain anonymity, no

names were included in the information gathered. To protect data, it was stored on a password-protected computer. The value of confidentiality was taught to every member of the research team during their training.

## Results

The study participants comprised 162 individuals, representing an overall response rate of 89.0%. Of the respondents, 70 (43.2%) were in the 30-to-39-year-old age bracket. The majority of respondents, 132 (81.5%), were men. Most participants, 96 (59.3%), have worked in the university as security staff for at least 11 years. (Table 1).

**Table 1: Socio-demographic characteristics of respondents**

| Characteristic | Frequency (%) |
|---|---|
| Age (years) | |
| ⩽ 19 | 2 (1.2) |
| 20 – 29 | 24 (14.8) |
| 30 – 39 | 70 (43.2) |
| 40 – 49 | 56 (34.6) |
| 50 – 59 | 10 (6.2) |
| Gender | |
| Male | 132 (81.5) |
| Female | 30 (18.5) |
| Number of years at UCC (years) | |
| <5 | 40 (24.7) |
| 5-10 | 26 (16.0) |
| 11-15 | 52 (32.1) |
| >15 | 44 (27.2) |
| Education | |
| Senior High School Certificate | 84 (51.9) |
| Diploma | 50 (30.9) |
| Bachelor's degree | 20 (12.3) |
| Masters' degree | 6 (3.7) |
| Others | 2 (1.2) |

The respondents exhibited inadequate knowledge of occupational health, achieving an aggregate mean score of 2.93 ± 1.77 (maximum score of 7). Knowledge was significantly associated with attitude scores ($p < 0.001$) (CI: 0.032 – 0.083) and the availability of PPEs ($p < 0.018$) (CI: 0.014 – 0.143). There was no significant association between knowledge and age group ($p = 0.23$). A weak, positive, and significant association was found between knowledge scores and awareness of safety precautions ($r = 0.186$, $p = 0.018$). Although all participants, 162 (100%), indicated awareness of occupational health, only 60 (37.0%) comprehended it as pertaining to the well-being of employees, employers, and clients. The respondent demonstrated a good understanding of the necessary safety precautions, achieving an overall score of 6.13 ± 1.6 (maximum score of 7). The polled security staff demonstrated commendable occupational safety practices, achieving an overall mean score of 11.53 ± 2.90 (with a maximum possible score of 14).

A significant proportion of respondents, 126 (77.8%), were unaware of the processes established at the workplace to mitigate occupational dangers. In the event of an occupational health issue, the majority of participants, 104 (64.2%), were uninformed about any designated office or person responsible for addressing it. Only 18 (11.1%) indicated that they were to report an occupational injury. In the year preceding the research, only 96 of 162 respondents (59.3%) indicated that they had received any Occupational Health and Safety (OHS) training. Merely twelve individuals (7.4%)

of those polled participated in pre-employment training for occupational health and safety. Almost all respondents, 160 (98.8%), surveyed, perceived their employment as high risk. The attitude of respondents towards occupational health and safety was found to be very high, with a mean score of 39.01 ± 7.02 (maximum score of 50). Reasons for perceiving their job as risky were danger of being physically abused, 61 out of 162 (37.6%), fear of being verbally abused, 42 (25.9%), developing musculoskeletal disorders, 31 (19.1%), and working for long hours, 28 (17.4%). Respondents reported any health difficulties they experienced in the year preceding the poll that could be linked to their profession. Respondents identified low back pain,120 of 162(74.07%), and neck discomfort, 84 (51.9%), as the two predominant health concerns. Most of the security staff interviewed,140 of 162 (86.4%), reported experiencing stress due to their work.

Participants indicated exposure to three main hazards: environmental,494 responses (76.2%), ergonomic,284 responses (87.7%), and psychosexual, 76 responses (69.9%).

As illustrated in Table 2, the predominant environmental concerns observed were elevated noise levels, 132 (81.5%) and exposure to extreme weather conditions 152 (93.8%).

**Table 2: Exposure to occupational hazards among respondents**

| Type of hazard | Exposed Frequency (%) |
|---|---|
| **Environmental** | |
| Exposure to extreme weather | 152 (93.8) |
| High noise | 132 (81.5) |
| Lack of privacy | 112 (69.1) |
| Exposure to mosquitoes | 98 (60.5) |
| **Ergonomic** | |
| Standing for long hours | 146 (90.1) |
| Walking for long hours | 138 (85.2) |
| **Psychosocial** | |
| Verbal assaults from students | 76 (46.9) |
| Physical assaults from co-workers and students | 56 (34.6) |
| Working for long hours | 162 (100) |
| Time pressures, skipping meals and medications | 159 (98.1) |
| Sleep disorders | 96 (59.3) |
| Sexual harassment | 0 |

Only 54 (60.0%) respondents were aware of the existence of the workers' compensation law in Ghana. No incidents of sexual harassment were reported. All respondents complained of extended working hours, whilst 159 (98.1%) were worried about having to skip meals and drugs due to work. When asked if they report any occupational exposures at work, 38 (23.5%) reported always doing so, 80 (49.4%) indicated that they sometimes do, and 44 (27.2%) never do. The reasons given by respondents who do not always report their occupational exposures, 124 (76.5%) included delay in response, 21 (17.3%), no action will be taken, 25 (20.4%), being blamed for the incident, 28 (22.2%), and not knowing who to report to, 43 (34.6%).

Respondents reported a high availability of PPEs, with a mean score of 14.36 ± 6.62 (maximum score: 32). Regarding their use of PPEs, respondents scored high, with a mean of 14.21 ± 6.00 (maximum score: 32). A strong positive correlation was found between the availability and use of PPEs ($r = 0.895$, $p < 0.001$).

The research team visited the various security posts on campus and made the following observations:

General Safety: The lighting in the various offices inspected was adequate. However, all the guard

posts visited were poorly lit and did not provide adequate protection against rain and heat. There were also no mosquito nets in place. Even though surveillance cameras were available in many parts of campus, some key areas did not have cameras installed.

When duty rosters were inspected, it was noticed that each personnel worked for 12 hours every day for 5 days a week. They run shift duties that include night shifts. It was also observed that they stood for about 7 hours during each duty period. There were no incident registers to record occupational exposures, so no records of occupational injuries were available for review.

The following PPEs were available for inspection: boots, gloves, high-visibility vests, and lone worker alarms. All staff on night duties were equipped with flashlights and a baton for defense. At the time of observation, none of the participants on duty wore stab-resistant vests, protective shields, or arm guards, and had no tear gas or stun devices for riot control if the need arose.

Table 3 reveals the findings of the decision matrix risk assessment conducted at the guard posts of security workers at the University of Cape Coast (UCC). This procedure assessed and identified common risks in the workplace. To ensure consistency in risk assessments, three independent occupational health experts evaluated workplace hazards using a standardized risk matrix. Inter-rater reliability was assessed using Fleiss' Kappa, yielding a value of 0.78, indicating substantial agreement among raters. Discrepancies were resolved through consensus discussions.

Staff were found to be most at risk of musculoskeletal injuries (Risk Score 20), stress (Risk Score 20), and mosquito bites (Risk score 16).

**Table 3: Risk Assessment Matrix evaluating common hazards identified at the University of Cape Coast among security staff.**

| Risk/ Activity | Hazards | Probability of Occurrence (P) | Severity (S) | Risk Score (P x S) | Outcome | Control Measures |
|---|---|---|---|---|---|---|
| Musculoskeletal injuries | Standing for long hours | 5 | 4 | 20 | HIGH RISK | There is an urgent need to reduce working hours |
| Stress | Heavy workload, long working hours, inability to take annual leave | 4 | 5 | 20 | HIGH RISK | Need to increase staff strength to reduce workload, and ensure leave periods |
| Mosquito and other insect bites | Poor protection against insect bites | 4 | 4 | 16 | HIGH RISK | Guard posts should have nets to prevent the insects from entering. Staff should be given insect repellents |

| | | | | | | |
|---|---|---|---|---|---|---|
| Injuries from physical assault | There are inadequate stab-resistant vests and some anti-riot tools like pepper spray, tear gas, protective shields, and arm guards. | 2 | 5 | 10 | LOW | Provision of non-lethal anti-riot tools and PPEs with proper training in their usage |

A safety climate score of 2.25±0.17 reflects a low or inadequate safety climate as perceived by the workers. The low score was primarily influenced by inadequate scores in management safety commitment (1.61±0.013), management safety justice (1.70±0.18), management safety empowerment (1.65±1.16), and the workers' own safety commitment (2.52±0.12). Table 4 presents the safety climate perception scores of the respondents

**Table 4: Respondents' safety climate perception scores distribution for the seven safety climate dimensions**

| | Dimension | Item | Mean | SD | Interpretation |
|---|---|---|---|---|---|
| 1. | Management safety priority, commitment, and competence | 9 | 1.61 | 0.13 | Low |
| 2. | Management safety empowerment | 7 | 1.65 | 0.16 | Low |
| 3. | Management safety justice | 6 | 1.70 | 0.18 | Low |
| 4. | Workers' safety commitment | 6 | 3.07 | 0.23 | Fairly low |
| 5. | Workers' safety priority and risk non-acceptance | 7 | 1.41 | 0.18 | Low |
| 6. | Safety communication, learning, and trust in co-workers' safety competence | 8 | 2.88 | 0.16 | Fairly low |
| 7. | Trust in the efficacy of safety systems | 7 | 3.44 | 0.15 | Good |
| **Total** | | **50** | **2.25** | **0.17** | **Low** |

## Discussion

This study highlights both systematic and organizational shortcomings influencing safety climate, risk exposure, and worker well-being by offering important insights into the occupational health and safety (OHS) circumstances and attitudes of security staff at the University of Cape Coast.

The mean safety climate score of 2.25 (±0.17) points to a generally poor safety environment that fits well with past research pointing to low managerial commitment and inadequate institutional safety culture as main obstacles in developing environments.[18,19] Particularly low were aspects like management safety priority, justice, and empowerment, a reflection of results

consistent with those of Dejoy et al.[20], who contend that employee confidence in management's safety justice is a major determinant of safety behavior and compliance.

Although every participant showed awareness of OHS ideas, only 37% of them accurately grasped its extent, therefore highlighting a surface level of awareness. This could probably be due to the low educational level of respondents, with a majority of them having a Senior High School certificate as their highest educational attainment. A similar finding was made in a study conducted among security guards in Nepal, revealing that about 65% of participants had attained only secondary education.[14] The fact that just 59.3% of respondents had any official OHS training and just 7.4% pre-employment highlights even more systematic neglect of capacity-building programs necessary to create a proactive safety culture.

The data confirm alarmingly high exposure to ergonomic hazards (87.7%), especially long hours of standing and walking, risk factors associated with musculoskeletal disorders (MSDs). This study reports a high prevalence of low back (74.0%) and neck pain (51.9%). This mirrors findings by Karande et al.[1] who identified a 96.6% prevalence of MSD among security workers in India. Another Indian study, among security workers, also identified a significant occurrence of low back pain, with about 47.69% reporting moderate disability due to prolonged standing and insufficient ergonomic support. [21] Working under such stress without organizational protections not only affects morale but also increases the risk of chronic illness and absenteeism.

Psychosocial hazards were reported by 67.8% of respondents. These included excessive hours, stress, and sleep difficulties. Security guards in this study worked 12 hours a day, five days a week, and were required to stand for more than half of that time. Bazana et al.[5] found that excessive work can harm social life, family relationships, and sleep. Night shifts may cause sleep difficulties. An observational study of 100 Delhi security officers indicated that 74.0% experienced sleep quality concerns and 48.0% had insomnia.[22]

Additionally, the reported psychosocial stress (86.4%), including verbal assaults and pressure to skip meals or medications, fits the broader literature on emotional labor in security roles. A Finnish study reported monthly prevalence rates of security guards experiencing verbal aggression at 39%, threats of assault at 19%, and physical acts at 15%.[23] Another study that was conducted among French security guards revealed a 40% exposure rate to physical and verbal violence. [24]

Only 23.5% of participants always reported occupational exposures, citing reasons like fear of blame (22.2%) and lack of knowledge on whom to report to (34.6%). These results correspond with previous Ghanaian campus studies[7,8] that highlight organizational inertia and fear of retaliation as significant barriers to incident reporting. Such conditions perpetuate a dangerous feedback loop where unreported hazards remain unaddressed, increasing cumulative risk.

In the risk assessment conducted, the most significant risk identified was musculoskeletal injury, primarily due to prolonged standing and walking, with 90.1% and 85.2% of respondents, respectively, reporting such exposures. These findings are consistent with previous literature indicating that static postures and extended shifts contribute heavily to lower back pain, neck strain, and joint discomfort among security guards.[1,6] The elevated risk score reflects both the frequency of exposure and the high severity of its impact, resulting in chronic pain, reduced productivity, and increased absenteeism. This underscores the need for ergonomic interventions such as task rotation, anti-fatigue mats, and flexible scheduling to mitigate risk.

Workplace stress was equally classified as high risk, with 86.4% of security personnel reporting job-related stress. Contributing factors include excessive workload, lack of leave periods, extended working hours, and psychosocial

stressors such as verbal abuse and insufficient organizational support. Studies from Serbia and Brazil also associate stress among security workers with hypertension, diabetes, and sleep disorders.[3,4] This high-risk score calls for urgent organizational restructuring, including increased staff recruitment, mandatory rest periods, and psychological support services, to alleviate stress and prevent burnout.

Environmental exposure to insect bites, particularly from mosquitoes, was another major concern. Nearly 94% of participants reported working in areas exposed to extreme weather conditions, with inadequate shelter and no mosquito nets in guard posts. While often overlooked in institutional OHS plans, frequent insect bites present real risks, including the transmission of vector-borne diseases such as malaria and dengue, especially in tropical settings like Ghana. The provision of mosquito nets, insect repellents, and structural upgrades to guard posts are, therefore, essential to lowering this risk.

Though not ranked as high as other hazards, the risk of physical assault remains significant due to inadequate protective gear. The absence of stab-resistant vests, riot shields, and non-lethal deterrents such as pepper spray increases workers' vulnerability, especially during campus conflicts or emergencies. This gap in protective resources aligns with global findings that frontline security staff in non-policing roles are often under-equipped to deal with high-risk confrontations. [25] Implementing modern PPE and tactical training would reduce both the probability and severity of such incidents.

This study underscores the urgent need for universities to develop tailored occupational health and safety (OHS) policies for campus security personnel. Key recommendations include strengthening managerial commitment to safety, implementing regular OHS training, improving ergonomic conditions and shift schedules, and establishing non-punitive injury reporting systems. Enhancing the availability and consistent use of personal protective equipment (PPE), upgrading guard posts to mitigate environmental hazards, and integrating mental health support into staff wellness programs are also essential. These interventions can significantly improve the safety, health, and job satisfaction of security staff within academic institutions.

## Limitations

This study is subject to several limitations. First, the reliance on self-reported data introduces the possibility of social desirability bias, where respondents may provide answers they perceive as favorable rather than truthful. To mitigate this, the study incorporated observational checklists and expert-led workplace assessments to validate participants' responses.

Second, the qualitative nature of expert risk evaluations may introduce subjectivity. This issue was addressed by engaging three independent occupational health specialists, who conducted separate assessments before reaching a consensus, thereby enhancing objectivity and reliability.

Finally, the cross-sectional design limits the ability to infer causality between safety climate factors and health outcomes. However, the triangulation of methods and tools, such as the NOSACQ-50 and structured questionnaires, helped to strengthen the internal validity and contextual depth of the findings.

## Conclusion

This study provides critical insights into the occupational health and safety (OHS) landscape for security personnel in Ghanaian higher education institutions, focusing on the University of Cape Coast. While there is universal awareness of OHS, the research reveals a significant disconnect between this awareness and practical competence, with insufficient knowledge and inconsistent safety practices. Systemic issues such as inadequate managerial commitment, a weak safety climate, inconsistent training, and a lack of incident reporting mechanisms contribute to high exposure rates to ergonomic, environmental, and psychosocial hazards, negatively affecting the

well-being, productivity, and morale of security staff. Employing the validated NOSACQ-50 tool, triangulated data sources, and expert-led risk assessments, the study ensures methodological rigor and a comprehensive evaluation of the safety climate. The findings underscore the urgent need for university administrations and policymakers to implement robust interventions, including structured training programs, ergonomic improvements, reliable injury reporting systems, and a redefined safety management culture that prioritizes transparency and worker empowerment.

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