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Occupational health hazards among healthcare providers and ancillary staff in Ghana: a scoping review

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ABSTRACT

Objective The strict implementation of occupational health and safety policy curbs exposure to occupational hazards. However, empirical evidence is lacking in the Ghanaian context. This review primarily aimed to explore exposure to occupational hazards among healthcare providers and ancillary staff in Ghana.

Design A scoping review was conducted based on Arksey and O'Malley's methodological framework and Levac *et al*'s methodological enhancement.

Data sources Searches were conducted of the PubMed, MEDLINE, CINAHL, Embase, PsycINFO and Scopus databases, as well as Google Scholar and websites of tertiary institutions in Ghana, for publications from 1 January 2010 to 30 November 2021.

Eligibility criteria Quantitative studies that were published in the English language and focused on occupational exposure to biological and/or non-biological hazards among healthcare professionals in Ghana were included.

Data extraction and synthesis Two independent reviewers extracted the data based on the type of occupational exposure and descriptive characteristics of the studies. The data are presented in tables and graphs. A narrative summary of review findings was prepared based on the review research questions.

Results Our systematic search strategy retrieved 507 publications; however, only 43 met the inclusion criteria. A little over one-quarter were unpublished theses/dissertations. The included studies were related to biological, psychosocial, ergonomic and other non-biological hazards. 55.8% of the studies were related to exposure to biological hazards and related preventive measures. In general, health workers were reported to use and comply with control and preventive measures; however, knowledge of control and preventive measures was suboptimal.

Conclusion Work is needed to address the issue of occupational health hazard exposure in Ghana's health system. More research is needed to understand the extent of these exposures and their effects on the health system.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This scoping review used the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews guidelines to guide the reporting of review findings.
⇒ A consultative approach was used in developing the research questions and search terms for this review.
⇒ Six electronic databases, Google Scholar and grey literature, specifically unpublished thesis and dissertations, were used as the main sources of relevant studies.
⇒ Two independent investigators conducted the screening of all articles using a set of minimum inclusion and exclusion criteria.
⇒ The articles included in this review did not go through quality assessment.

INTRODUCTION

Healthcare providers and ancillary staff are continuously exposed to different types of biological and non-biological hazards owing to their occupational surroundings, which are documented as unsafe working environments.[1–3] Undeniably, it is counterintuitive that the health workers who care for the sick work in an industry whose setting is labelled as 'high hazard'. The infection and reinfection of healthcare workers in the ongoing COVID-19 pandemic expose the vulnerability of the healthcare industry.[4]

Exposure to biological and non-biological occupational hazards has been well established in a plethora of empirical evidence. Even so, exposure to biological hazards such as hepatitis B virus (HBV), HIV, influenza and tuberculosis (TB) has gained more attention in terms of interventions such as safety programmes, personal protective equipment (PPE) and research work.[5] Non-biological hazard exposures emanating from formaldehyde, antineoplastic drugs, latex, ethylene oxide, and cleaning and disinfecting chemicals have been linked to asthma, unfavourable procreative outcomes and cancers.[6–10] Moreover, many studies have established varying incidences of non-biological hazards

such as burnout, stress, violence, injuries and musculoskeletal disorders in the healthcare industry.[11–13]

Furthermore, the issue of occupational injuries and exposures in the healthcare sector is a threat to both the high-income and low/middle-income countries. However, there has been much reduction in the occurrence of exposure and improvement in ways of mitigating the burden of the exposure in developed countries compared with developing countries, where occupational health and safety are not on the priority list.[14–16] Apart from insufficient data collection systems, poor application of safety rules and regulations, political negligence and healthcare personnel's non-adherence to universal safety precautions, a lack of data and inadequate policy implementation are among the main reasons why the subject of occupational health and safety has not been given much attention in third world countries.[17 18]

A data-driven approach is imperative in addressing this problem of occupational exposure in healthcare industries, especially the Ghanaian one.[16] In a quest to solve this problem in Ghana, the Ghana Health Service and the Ministry of Health implemented an Occupational Health and Safety Policy in 2010, and an updated version in 2021, which was solely in the context of COVID-19.[16 19] The earlier policy's insufficient data, poor data collection systems on occupational exposure and lack of sensitisation on occupational health and safety are challenges to addressing occupational exposure, which have improved over the period. A scoping review approach based on knowledge from Arksey and O'Malley's methodology[20] and Levac *et al*'s[21] methodology enhancement was conducted to search the body of literature on occupational exposures among health personnel in Ghana.

Although some studies have employed scoping reviews methodology on the subject matter, most of these were done in developed countries. The few conducted in developing countries were for low/middle-income and sub-Saharan African countries, while the others considered only exposure to biological hazards and not non-biological hazards.[22–24] Likewise, those reviews which were carried out in developing countries did not include primary studies that had only ancillary staff as study participants, and workers in the elementary occupations category of the WHO health workers classification such as waste handlers and laundry workers.

This scoping review summarised the type and prevalence of exposure to occupational hazards, described health workers' knowledge of occupational exposure and available preventive measures, and explored predisposing factors of exposure to occupational hazards and utilisation of control/preventative measures.

METHODS

This scoping review was conducted based on guidance from Arksey and O'Malley's methodology framework[20] and Levac *et al*'s[21] methodology enhancement. Six steps were followed in conducting this review: (1) identifying the research question, (2) identifying relevant studies, (3) selecting studies, (4) charting the data, (5) collating, summarising and reporting findings, and (6) consulting with relevant stakeholders. However, the Joanna Briggs Institute's elements for scoping reviews, namely: Participants, Concepts and Context were used to define the core concept, focus participants, setting of studies and inclusion criteria of the review. Subsequently, these guided the formulation of research questions and the title of the review. The findings of this review were reported using Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines.[25] A detailed protocol for this scoping review has been published elsewhere.[26]

Research questions

To achieve a holistic view of the exposure to occupational hazards among healthcare providers and ancillary staff in Ghana, and based on the expertise of the research team and some stakeholders in the healthcare industry, the following research questions were developed for the direction of the conduct of this review:

1. What are the types and prevalence of exposure to occupational health hazards among healthcare providers and ancillary staff in Ghana?
2. What are the predisposing factors of exposure to occupational health hazards?
3. What are the available control/preventive measures for health workers?
4. What is the level of knowledge relating to the risk of exposure and control/preventive measures of occupational health hazards among health workers?
5. What is the level of adherence to these control/preventive measures?

Search strategy

The Medical Subject Headings terms and keywords 'Occupational exposure', 'occupational hazards', 'occupational risks', 'occupational diseases', 'occupational injuries', 'occupational accidents', 'occupational stress', 'sharp injuries', 'needle pricks', 'cuts', 'wounds', 'airborne diseases', 'infectious diseases', 'physical abuse', 'sexual abuse', 'verbal abuse', 'musculoskeletal injuries', 'slips', 'trips', 'falls', 'chemical spill', 'fractures', 'noise', 'burns', 'radiations', 'burnout', 'Health Personnel', 'health care workers', 'health professionals', 'nurse*', 'healthcare workforce', 'doctors', 'laboratory workers', 'midwives', 'students', 'kitchen staff', 'canteen workers', 'laundry workers', 'Waste handlers', clean*, 'Ghana' and 'Ghana*' were identified from the research questions. An initial search was carried out to develop the search strategy (the search string is shown in the online supplemental appendix I). The search strategy was used to identify articles in Embase, CINAHL, PsycINFO, PubMed, MEDLINE, Scopus and Google Scholar from 1 January 2010 until 30 November 2021, over a decade after the implementation of the 2010 Occupational Health and Safety Policy for the Ghana health sector. Moreover, articles were limited to

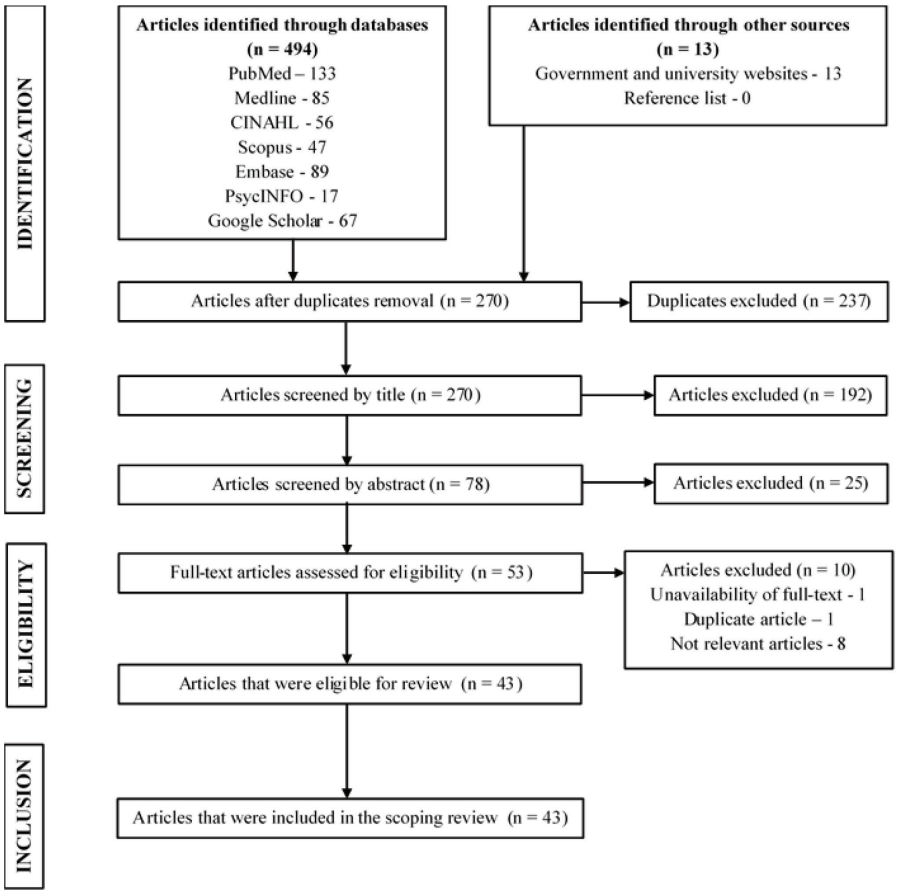

Figure 1 Flow chart illustrating the scoping review study selection process.

those published in the English language. Due to the six databases used for the review, not more than 100 hits of Google searches were screened. Reference lists of articles included in the review were hand-screened as well as other non-electronic materials to identify other studies. Grey publications, specifically dissertations/theses, were retrieved through a search on tertiary institutions' websites. The five major tertiary institutions searched comprised the University of Ghana, Kwame Nkrumah University of Science and Technology, University of Cape Coast, University of Development Studies and Central University.

Study selection

Studies included in the scoping review were those: (1) conducted among healthcare providers, healthcare students, ancillary staff or general health workers; (2) done on occupational exposures to biological and non-biological hazards; (3) carried out in healthcare facilities in Ghana; (4) based on quantitative, cross-sectional, case–control, prospective and retrospective cohort study designs; and (5) studies published from 1 January 2010 until 30 November 2021 and in the English language. Additionally, studies (1) conducted among participants not working in healthcare facilities, and (2) based on a qualitative study approach were excluded from the review.

After the removal of duplicates from extracted articles, both title and abstract screening were carried out independently by two reviewers (PAT and AB-A) against a group of minimum inclusion and exclusion criteria including participants' characteristics, concept of the study, context or setting of the study. Any article adjudged as relevant by any of these reviewers was included for a full-text review. The full-text review was subsequently carried out by these two reviewers. Any discrepancies and disagreements in selecting a particular article were subjected to a second review and further discussion with the other two reviewers (EA-B and EA-G) to achieve a consensus and control reviewer bias.

Data extraction

For every article included in this scoping review, descriptive characteristics comprising of authors, year of publication, title of study, region of study, study design, study population and sample size, methodology and instrument used, and key findings were extracted. Furthermore, key outcomes were charted based on the review questions. This process was also carried out by the two independent reviewers (PAT and AB-A). A final extraction form is shown in the online supplemental appendix II.

Synthesising review results

The study characteristics of articles covering the study population, year of publication, number of studies published in peer-reviewed journals and region of the study were presented in graphs. Also, studies were

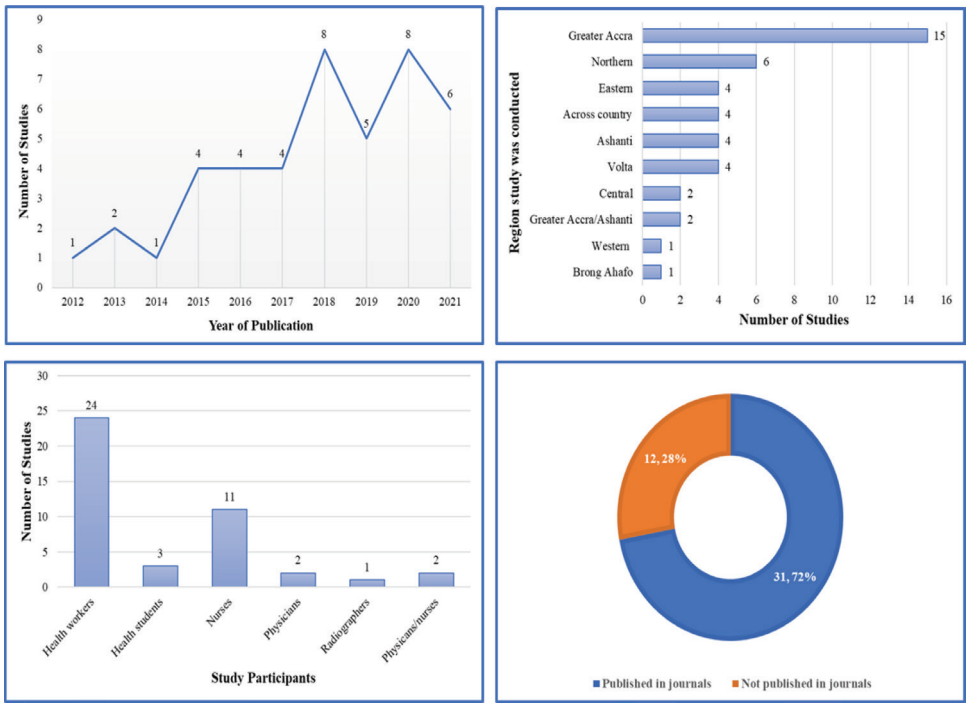

Figure 2 Characteristics of studies.

tabulated based on the type of occupational exposure and preventive measure. Included studies were then summarised according to their study characteristics: authors, year of publication, topic, region of study, study design, study population, sample size, methodology/instrument(s) used and key findings. Finally, using the review research questions as guidance, a narrative was used to summarise the outcome of the studies.

Patient and public involvement

None.

RESULTS

Four hundred and ninety-four publications were identified from a search involving six databases and Google Scholar (figure 1). An additional 13 were retrieved from government and university websites; thus, the total number of articles retrieved was 507. After the removal of duplicates, 270 were screened by title, followed by an abstract screening of 78 articles.

Fifty-three articles were appropriate for full-text examination; yet, 43 were eligible for the scoping review (figure 1). Most of the eligible articles (n=27, 62.8%) were published within the past 3years (2018–2021) of the review (figure 2). However, 12 (n=12, 28.0%) studies included in this review are dissertations and were not published in peer-reviewed journals (figure 2). Almost all studies included in this review were conducted using a cross-sectional study design with a relatively larger number of them (n=15, 34.9%) conducted in the Greater Accra Region (figure 2). More than half (n=24, 55.8%) of these studies employed the general health workers group as study participants (figure 2), followed by nurses (n=11, 25.6%).

Relating to the type of occupational hazard being investigated, a greater number (n=24, 55.8%) of the eligible studies (n=43) were done on biological hazards, followed by psychosocial hazards (n=14, 32.6%), both biological and non-biological hazards (n=4, 9.3%), and ergonomic hazards (n=1, 2.3%) (table 1).

Among the studies on biological hazards, the majority of them (n=9) examined exposure to blood and body fluids, and it was followed by those on infection control and prevention (n=6). The rest were conducted on post-exposure prophylaxis (PEP), hepatitis B vaccine uptake, hand hygiene and face mask compliance, and exposure to COVID-19 (table 1 and online supplemental tables 1–4). Similarly, regarding studies on psychosocial hazards, almost all (n=13) investigated stress and burnout, and one was done on workplace violence (table 1 and online supplemental tables 1–4). Likewise, relating to ergonomic hazards, only a single study was conducted on exposure to musculoskeletal disorders (table 1 and online supplemental tables 1–4). Moreover, studies on both biological and non-biological hazards were mainly related to occupational hazards and safety practices (table 1 and online supplemental tables 1–4).

DISCUSSION

This scoping review focused on mapping the existing empirical evidence on occupational exposure to healthcare providers and ancillary staff in Ghana. Inclusive of 43 articles, this review was quite extensive and comprised of studies relating to exposure to both biological and non-biological hazards as well as their significant risk factors, availability and utilisation of control/preventive measures, and knowledge on control and preventive measures.

Table 1 Studies summarised according to types of occupational hazards

Types of hazards	Frequency (43)	Percentage
Biological	**24**	55.81
Blood and body fluids	9	
COVID-19	1	
Hand hygiene and face mask compliance	3	
Hepatitis B vaccine uptake	3	
Post-exposure prophylaxis	3	
Infection control and prevention	6	
Psychosocial	**14**	32.56
Stress and burnout	13	
Violence	1	
Ergonomic	**1**	2.33
Musculoskeletal disorders	1	
Biological and non-biological	**4**	9.30
Occupational hazards and safety practices	4	

Nonetheless, a greater proportion of these studies were centred on biological hazards and their preventive and control measures compared with the other types of occupational hazards. This finding was similar to a recent review by Rai *et al*,[22] where more studies were related to biological hazards.

The past 3 years of this review witnessed quite a greater number of research work on occupational health and safety, but the evidence is weak since more rigorous study designs were not employed in almost all articles. Yet, the huge number of studies indicates the recognition of the subject area in Ghana's healthcare industry and can serve as a precursor to the production of a higher form of evidence in the field.[19] According to this review, most studies were conducted among the general health workers, which may include ancillary staff, but no study employing ancillary staff only as participants was done in the years considered for this review. This is alarming because these groups of workers (ancillary staff) may be more exposed than healthcare providers. Subsequently, it suggests that we have to take a closer look at this category of workers.

Biological hazards

Blood and body fluids

Exposure to blood and body fluids among healthcare professionals has become the most prevalent means of exposure to bloodborne pathogens hence making it a problem of great concern in the healthcare industry.[24 27] Blood and body fluid exposure has been reported as a major predisposing factor to the transmission of common bloodborne infections including HIV.[28] Accidental contact with a patient's blood and body fluids during a medical procedure may not only affect the safety and well-being of the healthcare provider or ancillary staff but also disrupt the delivery of quality healthcare.[29 30]

Needlestick or sharp instrument-related injuries, a splash of body fluids and torn gloves are considered as some of the routes of exposure to blood and body fluids. However, sharp instrument-related or needlestick injury is highly recognised as one of the most serious occupational hazards among health workers,[31] and it is ranked as a high-risk route for acquiring and transmitting biological hazards such as HBV, hepatitis C virus and HIV.[31 32] The high prevalence of these bloodborne pathogens in low/middle-income countries, including Ghana, and the lack of safety measures to reduce their risks account for the increased transmission among healthcare providers and ancillary staff in developing countries.[33 34]

Two studies included in this review investigated exposure to blood and body fluids. Both studies reported a 12-month prevalence of 50.6%[35] and 67.5%.[36] While adequate PPE, being trained in infection prevention and control (IPC) practices and working in the outpatient department decreased the odds of exposure to blood and body fluids, having had working experience, and moderate and high-risk perception increased the chances of exposure to blood and body fluids.[35 36]

According to this review, many studies investigated sharp instrument-related injuries as a route of exposure to biological hazards. The studies included in this review reported variable prevalence of sharp instrument-related injuries including needlestick injuries and cuts. The prevalence was reported in the past 12 months for most studies with a study reporting a lifetime prevalence. The prevalence of sharp instrument injuries and needlestick injuries was reported in four studies, while cuts were reported in three studies.

The prevalence of sharp instrument-related injuries over 1 year ranged from 7.9% in a study conducted in the Volta Region to 53.7% in a study carried out in the Greater Accra Region.[35–40] Besides, needlestick injury prevalence over the 12-month duration ranged from 14.0% in a study done in the Volta Region to 66.0% in a study conducted in the Northern Region.[35 37 40–42] A lifetime prevalence of needlestick injuries was reported as 54.6% in a study conducted in the Northern Region.[41] Further, two studies conducted in the Volta and Greater Accra Regions reported a 12-month prevalence of splash of blood and body fluids at 21.3% and 60.5%, respectively. Also, a 1-year prevalence of cuts was reported as 34.6%, 62.1% and 70.5% in studies conducted in Ashanti, Greater Accra and Northern Regions, respectively.[37 40 43] A single study reported an annual prevalence of torn gloves as 32.0%.[35]

The presence of safety guidelines, having worked for more than 5 years, being 30 years and above and working in a district-level hospital were associated with increased

events of sharp instrument-related injuries.[39 42] The female gender was negatively associated with needlestick injuries, whereas age of 30 years and above and having had infection prevention and control training in the last 5 years were positively associated with needlestick injuries.[41] Preventive measures such as proper disposal of sharp objects, usage of PPE and training in occupational safety were highly used with usage rates of 86.6%, 85.8% and 62.2%, respectively,[40] while the system of reporting sharp instrument injuries was not used with almost half of study participants not reporting injuries.[41]

Additionally, in this review, some studies reported infection of bloodborne pathogens that may have resulted from exposure to blood and body fluids. One of the studies[36] reported that 25% of the participants who were exposed to blood and body fluids tested positive for HIV. Also, other studies in this review reported a pathogen infection prevalence of 13.8% and 33.0%.[43 44]

Exposure to COVID-19

The occupational contact of healthcare workers makes them the highest population at risk of exposure to COVID-19.[45] This risk of exposure has resulted in numerous COVID-19 infections reported across the globe.[46] Healthcare providers and ancillary workers are at the forefront of the fight against the pandemic and play critical roles such as clinical management of patients with COVID-19.[45 47] Our review included a study that involved the risk of exposure to COVID-19 assessment among healthcare professionals. Despite the high level (80.4%) of occupational exposure to COVID-19 among health workers, 14.0% of them were at a high risk of COVID-19 infection.[48] Workers who were involved in aerosol-generating procedures were positively associated with a high risk of COVID-19 infection, while Master's degree holders and registered nurses were negatively associated with a high risk of COVID-19 infection.

Hand hygiene and face mask compliance

Hand hygiene continuously proves to be an effective way of preventing or reducing the transmission of healthcare-associated pathogens in the healthcare industry, where transmission of infection from patient to patient is mostly transferred through the hands of healthcare workers.[49 50] However, low compliance with hand hygiene among healthcare professionals is reported all over the world.[51] The combination of universal use of face mask and a comprehensive infection prevention programme has proven to reduce healthcare-associated cases of infectious diseases including COVID-19.[52 53] Nonetheless, compliance with face mask wearing among healthcare providers remains suboptimal irrespective of the recent call for universal use of face mask.[54]

Hand hygiene compliance was investigated in four of the studies included in this review; however, one of the studies considered both hand hygiene and face mask compliance. Compliance with hand hygiene ranged from 9.2% to 88.4%.[55–58] Perceived high risk, working in a children's ward and touching a patient during procedures were positively associated with hand hygiene compliance,[55 57] and afternoon and night shift, non-clinical category of worker, holder of a secondary-level certificate, and midwife and pharmacist cadres of health worker were negatively associated with hand hygiene compliance.[57 58] Alcohol hand rub and liquid soap dispensers were found to be readily available at facilities for hand hygiene compliance.[55] Face mask compliance level was reported at 73.7%.[56]

Hepatitis B vaccine uptake

Though hepatitis B infection is vaccine preventable, low uptake has been reported among healthcare workers in developing countries.[59] Studies conducted among healthcare professionals in sub-Saharan Africa have reported it between 35% and 65%,[59–61] which is below the WHO's recommended 100% coverage of hepatitis B vaccination. The uptake of the hepatitis B vaccine among healthcare personnel was explored in four studies included in this present review. The prevalence of at least one dose of hepatitis B vaccination uptake was reported within the range of 44.8%–90.4%.[62–65] Nonetheless, the full hepatitis B vaccination status of health personnel ranged from 49.4% to 80.0%.[62–65] Also, working for more than 16 years, daily exposure to blood and body fluids, use of sharp instruments, frequent exposure to stained linens and waste, and performing invasive procedures daily were positively associated with the vaccination status of health workers.[62] Similarly, health workers who had no knowledge of hepatitis B being more infectious than HIV and those who do not know about the effectiveness of hepatitis B vaccine were likely not to be vaccinated.[64] Two studies reported cost as a barrier to the coverage of hepatitis B vaccination among healthcare providers.[63 64]

Post-exposure prophylaxis

The prevention of a possible seroconversion of HIV or hepatitis B after exposure dwells on a timely uptake of PEP; unfortunately, healthcare workers hardly adhere to the PEP protocol.[66 67] Some studies looked at adherence to PEP protocol, while others investigated its knowledge and uptake in the event of occupational exposure. A single study included in this review ascertained adherence to HIV PEP protocol. The adherence to HIV PEP protocol among healthcare providers was 17.9%.[67] Study participants who received training on PEP were likely to adhere to HIV PEP protocol, while those who had low risk or could not assess their risk of occupational exposure were less likely to adhere to HIV PEP protocol.[67] Furthermore, uptake of HIV PEP was reported for two studies as 33.8% and 44.4%.[67 68]

A plethora of studies has published a lack of knowledge regarding PEP, which subsequently leaves an information gap in the healthcare system.[69 70] The insufficient knowledge of PEP has been attributed to healthcare workers' attitudes towards PEP, fear of stigmatisation and adverse side effects of the PEP treatment.[71] Adequate knowledge

of HIV PEP among health workers was reported as 16.6% and 44.9%.[67 68] Relating to the study on knowledge of PEP for hepatitis B, 12.1% had adequate knowledge.[65]

IPC guidelines

Compliance with IPC precautions, methods and strategies is significant in the reduction of healthcare-associated infections.[72] Yet, varied compliance with IPC practices such as the use of PPE and hand hygiene has been published.[72 73] Also, training and education improve IPC practices and ultimately their compliance.[74 75] Five studies in this review investigated compliance with IPC guidelines. These IPC compliance studies related to PPE usage, hepatitis B infection preventive measures, TB preventive measures and general IPC compliance measures.

The general IPC compliance was reported at 54.9%[76] and IPC compliance for PPE usage was 90.6%.[58] Lower compliance with PPE usage was related to study participants who were separated/divorced/widowed, secondary education leavers, non-clinical staff, cleaners, pharmacists and those who reported inadequate PPE.[58] Likewise, compliance with hepatitis B infection preventive measures was 16.1%.[77] Besides, being in medical/obstetrics/gynaecology departments and the availability of dustbin liners were always positively associated with adherence to HBV infection preventive measures.[77] Additionally, in other studies in the review, 51.0% had moderate knowledge of general infection control preventive guidelines and 69.9% had high knowledge of hepatitis B infection.[76 77] There was high availability and access to IPC materials including PPE, handwashing facilities and dustbin liners.[76 77]

Relating to TB infection, knowledge of its IPC measures was not satisfactory.[78–80] Two studies in this review looked at knowledge of TB infection prevention measures. About 59.8% of health workers had adequate knowledge of TB infection preventive measures, and a percentage mean score of knowledge (67.2%) was reported among healthcare workers.[81 82] Additionally, adequate knowledge of TB, having 2–5 years of working experience, being a holder of a certificate and other higher educational qualifications, and having had training in TB IPC practices were positively associated with TB infection prevention practices.[81] Again, approximately 27.1% of doctors and nurses practised effective TB infection prevention measures.[81]

Low knowledge of standard precautions is recorded among healthcare personnel in developing countries including Ghana.[65 83 84] Moreover, adequate knowledge is likely to influence compliance with standard precautions.[65 83 84] The general knowledge of the basic concepts of standard precautions was low as reported in the only study in this review that investigated standard precautions and barriers to compliance with them.[85] In the study, only 37.0%, 39.0% and 40.0% who knew that standard precaution involved hand washing before and after directly touching the patient had knowledge on cough etiquette and knew aseptic techniques regarding infection prevention measures, respectively.[85] The major barriers that hindered the compliance with these precautions included lack of time, panic among patients, demands for patient care and lack of PPE. Further, sufficient knowledge of general control measures, individual protective practices and institutional culture and practices were reported as 96.0%, 82.5% and 79.2%, respectively.[86]

Psychological hazards

Stress and burnout

The incidence of burnout among healthcare providers, particularly physicians, has increased over time. One in every three physicians is at risk of occupational burnout.[87] Low remuneration, work–life imbalance and postgraduate training challenges are prevailing risk factors for burnout.[88] Additionally, burnout has an immense effect on the healthcare system such as absenteeism, decreased commitment and job satisfaction, lower effectiveness and productivity, workforce turnover, risks to patient safety and ultimately poor quality of care.[89–91] Additionally, the workers in the healthcare industry are highlighted as one of the occupational groups who experienced elevated stress levels in their line of work and are at risk of developing several occupational stress symptoms.[92 93] Understaffing, high job demands, insufficient resources and compassion fatigue, and risk of infection are among the prevailing reasons that lead to increased job strain, occupational stress and poor service delivery.[94]

In this present review, seven studies that made the inclusion criteria investigated burnout. While some of the studies reported general burnout, others reported components of burnout—depersonalisation, personal achievement and emotional exhaustion. General burnout was reported from a range of 9.9% to 47.0%.[95–98] Emotional burnout was reported from a minimum of 10.8% to a maximum of 62.5%,[98–101] depersonalisation burnout was reported from 5.5% to 55.0%[98–101] and personal achievement burnout was reported from 7.8% to 58.4%.[98–101]

Nurse occupation, health workers who were 40–50 years and fear of contracting COVID-19 infection were positively associated with burnout, whereas health workers who felt prepared for COVID-19 and enjoyed support from family were negatively associated with burnout.[97 98] In addition, work-to-family conflict and career dissatisfaction were positively associated with burnout.[95 96] Also, extra work hours and night shifts were positively associated with emotional exhaustion and depersonalisation.[99] A problem-focused coping strategy, emotional support from family/friends as a coping strategy, using humour and listening to music were suggested as ways of preventing burnout.[100]

About work-related stress, seven articles were included in this review. Stress levels were reported within the range of 4.0%–89.8%.[97 98 102–106] However, a study reported stress as 10% above the Weiman Occupational Stress Scale.[107] Being hypertensive and reporting sickness absence were positively related to work-related stress.[102 104 105] Receipt of appreciation from management, enjoyment of family support and being prepared for the COVID-19 pandemic were associated with lower stress levels,[98] while fear of

COVID-19 infection and absence due to sickness were related to higher stress levels.[98]

Violence

The issue of violence in the healthcare sector is extensively documented both in developing and developed countries.[108–110] Also, healthcare professionals are 16 times more exposed to workplace-related violence.[111] The cost of healthcare services, poor quality of healthcare, low knowledge of the healthcare system, no or lack of faith in the judicial system and vulnerability of healthcare facilities are factors that trigger the menace of violence.[112] Workplace violence can be in the form of physical assault, verbal abuse and sexual harassment. A 12-month occurrence of sexual harassment was 12.0% and that of verbal assault was 52.2% in one of the two studies included in this review.[113] The other study reported workplace violence of 24.4% over the past year, where frequent verbal abusers were relatives of patients and sexual perpetrators were doctors.[40 113]

Ergonomic hazards

Musculoskeletal injuries

Healthcare workers are most vulnerable to work-related musculoskeletal injuries due to their line of work.[114 115] About one-third of all sick leave among healthcare personnel is attributed to musculoskeletal disorders or injuries.[116] However, these injuries are under-reported, even in developed countries.[117] Three studies related to musculoskeletal injuries satisfied the inclusion criteria for this current review. In one of the studies, a 1 year and a week of musculoskeletal injury prevalence of 70.1% and 44.6% were reported, respectively.[118] Likewise, a 12-month prevalence of lower back pain injuries was reported in two studies as 49.5% and 51.2%.[44 119]

Physical hazards

Physical hazards such as radiation, slips and falls, and noise among others are also experienced by healthcare providers though many studies do not concentrate on these hazards. Physical hazards such as slips, trips and falls, and being hit by objects were examined in two studies in this review. A 1-year prevalence of slips, trips and falls, and being hit by objects were reported as 27.0% and 25.2%, respectively.[40 119]

Chemical hazards

Though healthcare professionals experience various forms of chemical exposure including disinfectants, latex in gloves and antineoplastic drugs, just a single study was found on chemical exposure within the year under this review. About 27.0% of health professionals in this study were found to be exposed to disinfectants, which resulted in irritation.

Finally, some studies included in this review either considered exposure to a collection of occupational hazards or some types of occupational hazards as a single variable. One such study that considered non-biological hazards as one variable found the experience of verbal assault to be positively related to non-biological hazards, whereas single marital status was negatively associated with non-biological hazards.[43] Additionally, the study found that being clinical staff, experiencing extreme pressure from work and being a victim of a verbal assault were positively associated with biological hazards, while poor maintenance of hospital items was negatively related to biological hazards.[43] A single study included in this current review reported a collective exposure to occupational health hazards among healthcare personnel as 44.0%.[120] Furthermore, more years on the ward were positively associated with exposure to occupational health hazards.[120] Finally, three studies in this review considered the knowledge of exposure to occupational health hazards. Knowledge of exposure to occupational health hazards and safety was reported within a range of 66.5%–92.7%.[44 86 120] There were adequate knowledge of exposure to biological (93.5%), psychological (84.0%), ergonomic (82.0%), physical (72.0%) and chemical hazards (66.5%).[86]

Implications

This scoping review has depicted that healthcare providers and ancillary staff in Ghana are invariably exposed to a wide scope of both biological and non-biological occupational hazards. Exposure to biological hazards is reported to occur frequently in low/middle-income countries,[22] and our review found similar findings, confirming the frequent exposure to biological hazards in healthcare settings and developing countries such as Ghana.

The risk factors of occupational exposures in this review were mainly individual and health facility related. This calls for government and non-governmental organisations to consider ways of equipping healthcare facilities with adequate resources including PPE. Also, the provision of training opportunities on these exposures for workers in the health sector can help in curbing these exposures. The review further reveals that compliance with and utilisation of control/preventive measures regarding exposure to occupational hazards were not adequate. Further, health facility managers and supervisors should enforce prevention and control measures, implement policies and increase supervisory roles. This will increase the utilisation of available preventive measures and subsequently curb non-compliance. Furthermore, low knowledge of control/preventive measures among healthcare workers was revealed in this review. A knowledge gap is a fundamental problem that can retard the fight against the control and prevention of occupational health hazards. Healthcare providers should be encouraged to undertake refresher courses to keep them updated on occupational exposures and IPC measures in healthcare settings.

Over the last 3 years, there has been an increase in the number of research work related to occupational health hazards; this is encouraging and it will bring improvement of services in the healthcare industry, if their findings are adequately implemented. However, more work needs to be done since almost all studies

were based on cross-sectional designs. To substantiate the current evidence available, prospective designs and other vigorous study designs are needed. Moreover, holistic evidence on occupational exposure in the healthcare industry of Ghana is difficult to ascertain because there was no single study that considered only ancillary staff or workers in the WHO elementary occupations category as study participants. Though the authors of this review were keen on finding studies conducted among this category of workers, none were found. Nonetheless, this group of workers was considered as part of studies that considered health workers as a whole, and most studies in this review looked at study participants from this angle.

Strengths and limitations of the review

This scoping review provides broad coverage of exposure to occupational health hazards among healthcare providers and ancillary staff in Ghana because it did not only consider the prevalence of these exposures but also looked at predisposing factors that are attributed to these exposures as well as knowledge and utilisation of the control/preventive measures. Research questions and search terms for this review were developed through a consultative approach. Furthermore, articles were searched in six broad databases and Google Scholar through a systematic approach. Two authors were independently involved in all screening processes of the review and all discrepancies were resolved through consultation with other two reviewers. Lastly, this review was reported according to PRISMA-ScR guidelines.

The main limitation of this review was that quality assessments of articles were not done; some unpublished theses and dissertations were included in the review. This implies that some of the eligible articles could be of poor quality. Additionally, this review was restricted to articles published in the English language and within a review period. Also, since the title and abstract screening were done separately, there could have been loss of eligible studies because some titles can be misleading. However, two independent reviewers undertook all the screening stages of this review to reduce the effect of this limitation. Finally, though a search strategy was developed and used for the review, all eligible data may not have been captured by it. The review was comprehensive enough irrespective of these limitations.

CONCLUSION

Quite a considerable number of healthcare providers and ancillary staff are exposed to both biological and non-biological occupational health hazards. The predisposing factors of these exposures were primarily individual and facility related. The compliance and utilisation of control/preventive measures were not adequate. The knowledge level of control/preventive measures relating to occupational hazard exposure was also suboptimal. Though studies that examined occupational health hazards have increased over the last 3 years, there is still a lack of recognition and knowledge gap of the exposures in the Ghana healthcare system. Apart from exposure to biological hazards and their preventive measures, which have received some research attention, all the other exposures have not been extensively studied. An urgent call is required to study occupational exposure in the Ghanaian healthcare system using rigorous study designs such as prospective studies.

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