

BMJ Open Identifying occupational health hazards among healthcare providers and ancillary staff in Ghana: a scoping review protocol

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To cite: Tawiah PA, Baffour-Awuah A, Appiah-Brempong E, *et al.* Identifying occupational health hazards among healthcare providers and ancillary staff in Ghana: a scoping review protocol. *BMJ Open* 2022;**12**:e058048. doi:10.1136/bmjopen-2021-058048

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2021-058048>).

Received 08 October 2021
Accepted 20 December 2021



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ABSTRACT

Introduction The formation, modification and implementation of occupational health and safety policy for the Ghana healthcare industry hinge on data and reviews on occupational exposures. However, there is no synthesised review to speak to the issues of these occupational exposures. A scoping review on occupational exposures among the health workforce in Ghana will provide a broad overview of exposures, and can guide and assist in making decisions on occupational health issues relating to healthcare workers.

Methods and analysis Arksey and O'Malley's scoping review methodology framework will guide the conduct of this scoping review. Primary research studies, government documents and other information on occupational exposures among healthcare workers published in the English language will be retrieved from databases including PubMed, CINAHL, Embase, MEDLINE, Scopus, PsycINFO and Google scholar. A systematic search strategy will be employed to identify articles from 1 January 2010 until 30 November 2021. Also, grey literature sources in Ghana including government and tertiary institutions websites will be searched. A reference list of key studies and other available non-electronic materials will also be screened to identify relevant studies for inclusion. The review will consider studies that address prevalence, knowledge and predisposing factors of occupational exposures along with the use of occupational hazards control/preventive measures. After removal of duplicates, and title and abstract screening, relevant articles will be subjected to full-text analysis. The screening processes will be conducted independently by two reviewers. Data will then be extracted and presented in tabular form with a narrative to aid easy comprehension.

Ethics and dissemination This scoping review does not require ethical approval. The findings will be disseminated through publications, conference presentations and stakeholder meetings.

INTRODUCTION

The healthcare sector is considered as one of the industries that present the most unsafe occupational settings, placing healthcare providers and ancillary staff at risk of exposure to numerous forms of biological and

Strengths and limitations of this study

- This present scoping review will use Preferred Items for Systematic reviews and Meta-analyses extension for Scoping Reviews guidelines when reporting the findings.
- A consultative approach was used in developing the research questions and search terms for this protocol.
- Seven electronic databases and grey literature, specifically unpublished thesis and dissertations, will be used as main sources of relevant studies.
- Two independent investigators will conduct the screening of all articles using a set of minimum inclusion and exclusion criteria.
- The articles included in this review will not be subjected to quality assessment.

non-biological hazards.^{1–3} These hazards endanger the safety, well-being and ultimately the life of the healthcare professional. The recent ongoing COVID-19 pandemic reveals the vulnerability of health personnel and the healthcare system.⁴

Even though the key attention of research and safety programmes among healthcare providers are infectious agents such as hepatitis B, HIV, influenza and tuberculosis,⁵ healthcare professionals are also prone to hazards arising from chemicals such as ethylene oxide, formaldehyde, antineoplastic drugs, latex, cleaning and disinfecting agents, which have been associated with cancers, adverse procreative outcomes and asthma.^{6–10} Also, musculoskeletal disorders and injuries, psychosocial hazards such as burn-out, stress and violence are experienced in the work environment.^{11–13}

Whereas these exposures have been recognised in both developed and developing countries, safety and precautionary measures and standards have been implemented in

high-income countries to safeguard healthcare providers and mitigate the occurrence of these occupational exposures;¹⁴ however, in low-income and middle-income countries including Ghana, occupational and safety issues are mostly neglected.^{15 16}

The shortfall of occupational health in these developing countries is often blamed on inadequate resources, poor data collection systems, weak enforcement of safety regulations, poor implementation of policies and political commitment.¹⁷ Yet, the rise of occupational health hazards among healthcare professionals can partly be attributed to their inconsistencies in practising the universal safety precautions: handwashing, wearing of gloves and use of other personal protective equipment (PPE).¹⁸

In Ghana, the subject of occupational health and safety among healthcare providers is not different from other developing countries. According to occupational health and safety policy guidelines developed for the health sector in 2010,¹⁶ the Ghana Health Service was not in a position to describe the incidence of diseases and exposures among its staff since there was no system to gather and compile information on hospital attendance, illness and occupational exposures suffered by its employees.¹⁶ Also, the policy emphasised that healthcare providers are not only exposed to occupational exposures but are also not sensitised to occupational health and safety issues. Hence, the need for a scoping review to map out the situation of occupational health exposures among the Ghanaian health sector.

An initial search conducted in MEDLINE, the Cochrane Database of Systematic Reviews and Joanna Briggs Institute (JBI) Evidence Synthesis found no scoping review underway on occupational exposures among healthcare providers and ancillary staff in Ghana. However, few scoping reviews have been conducted on the subject of occupational exposures in developed and developing countries. A recent scoping review done by Rai *et al* addressed exposures to both biological and non-biological occupational hazards among health workers in low-income and middle-income countries.¹⁹ Additionally, a systematic review conducted by Mossburg *et al* and Auta *et al* mainly looked at exposure to blood and blood-borne pathogens among healthcare professionals in sub-Saharan Africa.^{20 21} All these reviews described above and many other similar reviews mostly considered primary studies on healthcare providers and ancillary workers in the healthcare industry. Nonetheless, primary studies that had only ancillary staff (workers in the elementary occupations category of the WHO health worker classification) as study participants were not seen in those reviews. Meanwhile, this group of workers may be more exposed than healthcare providers (staff in the health professional and health associate professional of the WHO health worker classification).

This proposed scoping review will consider studies on healthcare providers (doctors, nurses, laboratory workers, midwives and other health professionals and

health associate professionals) as well as those that have only ancillary staff (waste handlers, laundry, kitchen staff and other elementary occupation workers) or general health workers as its study participants, which have been missing in many scoping reviews. Again, this review will specifically consider issues of preventive measures to occupational exposures such as vaccination, compliance to infection prevention control, use of PPE and control/preventive measures. The knowledge level on occupational exposures among the healthcare workforce will also be described in this review. Additionally, risk factors that are responsible for these exposures such as lack of working experience, working in multiple facilities and others will be explored.

Limiting this scoping review to Ghana is imperative because there is an absolute lack of data on occupational exposures among healthcare personnel¹⁶ and the situation in other low-income and middle-income countries may be similar but not the same in the context of Ghana. Since scoping reviews consider unpublished studies, it will provide a good platform to synthesize all these studies and provide good evidence for the modification of the existing policy, which had been in implementation for over a decade.

In the space of growing literature on the subject,¹⁹ many of these studies remain unpublished. Therefore, it is crucial to develop country-specific scoping reviews on an occasional basis, where unpublished and available non-electronic literature is considered. Scoping reviews, as defined by Arksey and O'Malley are conducted to map out fundamental concepts underlining a research subject (they do so by identifying types and main sources of existing evidence), and can be conducted as stand-alone research to synthesize evidence to inform policy on a research area.²² In this present work, scoping review was chosen over systematic review because the review sought to identify the kind of evidence available on this topic and subsequently, analyse the gaps in the knowledge domain. However, the authors hope to use this review as a precursor to systematic reviews on specific areas of this topic.

This scoping review centred on Ghana will assess exposures to occupational health hazards among healthcare providers and ancillary staff. Again, it will address knowledge gaps, utilisation of control/preventive measures, and predisposing factors of occupational health hazards. This review is being conducted to provide a comprehensive overview of occupational exposures in the Ghana health sector and is aimed at informing and shaping the existing occupational health and safety guidelines of the sector.

Study rationale

The menace of occupational exposure to healthcare providers and ancillary staff in developing countries is worst compared with their developed counterparts. In the quest to reduce these exposures, Ghana, a developing country, had developed a policy and guidelines

of occupational health and safety for the healthcare industry.¹⁶ However, the policy in its introduction emphasised the non-existence of systems to collate data on occupational exposures in the healthcare sector. After more than a decade since the inception of the policy, a scoping review will be necessary to describe the prevalence, knowledge and predisposing factors as well as the control/preventive measures of occupational health hazards among health workers. Yet, there is no synthesis of evidence on the exposure to occupational health hazards among personnel of the healthcare sector. Hence, the conduct of this scoping review. The findings of this review will be very significant in projecting the way forward on the topic of occupational exposures and also in terms of the modification of the existing policy.

Study objectives

The fundamental objective of this scoping review is to summarize the type and prevalence of exposure to occupational health hazards among healthcare providers and ancillary staff in Ghana. The study will also describe knowledge on occupational health hazards among healthcare providers and ancillary staff, predisposing factors responsible for the exposure to occupational health hazards and utilization of occupational health hazards control/preventive measures. Finally, these pieces of information will be synthesised to identify areas that need more consideration.

METHODS AND ANALYSIS

Protocol design

Arskey and O'Malley's²² methodology framework and Levac *et al's*²³ methodology enhancement formed the basis for the development of this protocol. Concerning this framework, six stages are involved in conducting a scoping review: (1) Identifying the research question, (2) Identifying relevant studies, (3) Selecting studies, (4) Charting the data, (5) Collating, summarising and reporting of findings and (6) Consulting with relevant stakeholders.

Stage 1: Identifying the research question

The main research question of this review is defined as: 'What are the types and prevalence of exposure to occupational health hazards among healthcare providers and ancillary staff in Ghana?'. This fundamental question was developed by the research team in consultation with some stakeholders in the healthcare industry of Ghana comprising workers in healthcare facilities and academicians in the field of occupational health. Through the consultations, some specific questions were developed in addition to the main research question: (1) What is the level of knowledge relating to the risk of exposure and control/preventive measures of occupational health hazards among healthcare workers? (2) What are the predisposing factors responsible for the exposure to occupational health hazards? (3) What are the available

control/preventive measures for the health workers to use? and (4) What is the level of utilisation of these control/preventive measures?

Stage 2: Identifying relevant studies

A search strategy will be aimed at locating both published and unpublished studies. An initial limited search of PubMed and MEDLINE was undertaken to identify articles on the topic. The text words contained in the titles and abstracts of relevant articles and the index terms used to describe the articles were used to develop a full search strategy for Embase, CINAHL, PsycINFO, PubMed, MEDLINE, Scopus and Google Scholar (the proposed search strategy is shown in online supplemental appendix I). This systematic search strategy will be used to identify articles from 1 January 2010 until 30 November 2021. Inclusion will be limited to studies published in the English Language. The reference list of all included sources of evidence and other non-electronic materials will be hand-screened for additional studies.

To guarantee that all relevant literature is included, sources of unpublished studies and other grey literature will be searched on the websites of health stakeholders and universities in Ghana. This will be done to identify theses/dissertations, reports and conference abstracts.

The search terms for the search strategy were developed with inputs from research teams, key stakeholders and knowledge users such as healthcare professionals, and university faculty members in the area of occupational health. An experienced librarian and coauthor (PAT) developed the initial search strategy; however, it will be subjected to revision pending inputs from other stakeholders. The final search strategy will be blinded to all stakeholders to prevent bias in the selection of articles that may have been published by these scholars or healthcare professionals.

Stage 3: Study selection

The study selection will be based on a set of inclusion and exclusion criteria. Inclusion criteria: (1) Studies on healthcare providers, healthcare students, ancillary staff or general health workers, (2) Studies on occupational exposures to biological and non-biological hazards, (3) Studies conducted in healthcare facilities in Ghana and (4) Studies based on prospective and retrospective cohort, case-control, cross-sectional study designs. Exclusion criteria: (1) Studies on participants not working in healthcare facilities and (2) Qualitative studies (The review aims to quantify the prevalence of occupational health hazards which may not be addressed in qualitative studies).

Before the study selection stage, Zotero reference management software²⁴ will be used to remove all duplicates of exported articles. Potentially relevant sources will be retrieved in full and their citation details imported into the Rayyan Qatar Computing Research Institute (QCRI) for Unified Management, Assessment and Review of Information,²⁵ a web-based and mobile application that

is specifically created for systematic and scoping reviews of articles.

The review procedure will involve two levels of screening: (1) A title and abstract and (2) Full-text review processes. Two independent investigators will conduct the initial screening of the title and abstract of all articles using a set of minimum inclusion and exclusion criteria. To ensure that our minimum inclusion and exclusion criteria are robust enough to capture any articles on occupational exposures among healthcare personnel in Ghana, they will be tested on a sample of abstracts before the actual review of article abstracts. Any article that is judged as relevant by one or both reviewers will be selected and subjected to a full-text review. In the next stage, a review of the articles' full texts will be done independently by the two investigators based on the inclusion and exclusion criteria. In case full-text review results in any discordant articles, the article will be subjected to a second review, and further discrepancies about its eligibility will be discussed with a third investigator until the investigators arrived at a full consensus.

Stage 4: Data extraction

A data collection tool will be created by the research group. This will be used to confirm the appropriateness of the study and serve as a guide to extract study characteristics. The data extracted will include, but will not be limited to, specific details such as year of publication, study design, participants' characteristics, the concept of the study, context or setting of the study, study methods and key findings relevant to the review question/s. A draft extraction form is provided (see online supplemental appendix II). The draft data extraction tool will be modified and revised as necessary during the process of extracting data from each included evidence source. Two reviewers will independently conduct the extraction of the data from all the included data. Afterwards, the extracted data from the two independent reviewers will be compared and any differences between them will be discussed further to ensure consistency and accuracy of the data. Data validation and coding will be ensured by compiling all extracted data in a single Microsoft Excel spreadsheet.

Stage 5: Data summary and synthesis of results

One of the reasons for a scoping review is to map out the concept that underpins a particular research area including the types of evidence available and the main sources of the evidence. The findings of this scoping review are to provide an overview of occupational health hazards exposure among healthcare providers and ancillary staff in Ghana, rather than the assessment of the individual studies in the review, and these findings will be reported according to the Preferred Items for Systematic reviews and Meta-analyses extension for Scoping Reviews guidelines. The overview will include the prevalence of exposures, utilisation of control/preventive measures and identified risk factors of exposure to occupational health

hazards. The data tabular form will be used; however, a graphical or diagrammatic presentation may be used where appropriate. A narrative summary will accompany the tabulated and/or charted results.

Stage 6: Consultation

According to Levac *et al.*,²³ consultation provides the platform for stakeholders to be involved in the scoping review process. They specifically provide information and insights outside what is usually reported in the literature. To address the reality of these exposures in the healthcare facilities in Ghana, stakeholders such as key employees of Ghana Health Service will be engaged throughout the conduct of this review through interviews. These employees also serve as knowledge users and victims of these exposures. Also, in developing the search strategy and identification of grey literature, these stakeholders were consulted.

Patient and public involvement

No patient was involved.

Ethics and dissemination

The study is geared towards providing an overview of occupational health hazards among healthcare providers and ancillary staff in Ghana. Again, it is aimed at providing relevant inputs in the modification of the existing occupational health and safety policy and guidelines for the health sector in Ghana. Therefore, the findings of the study will be shared among key stakeholders like the Ghana Health Service and Ministry of Health. It will also be made public to the universities that are into the training of public health, and occupational and environmental health specialists. The study will also be published in a peer-reviewed journal, presented at conferences and stakeholders meetings. Since the methodology of scoping reviews involves the collection and reviewing of already available materials in the public space, the study does not require ethical approval. However, this study will involve a consultative approach of key stakeholders that will guide the research objectives and facilitate the knowledge transition and translation process.

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Contributors PAT and EA-B conceived of the idea, developed the research question and study methods and contributed meaningfully to the drafting and editing. They also approved the final manuscript. AB-A and EA-G aided in developing the research question and study methods and contributed meaningfully to the drafting and editing and approved the final manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

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REFERENCES

- Moore RM, Kaczmarek RG. Occupational hazards to health care workers: diverse, ill-defined, and not fully appreciated. *Am J Infect Control* 1990;18:316–27.
- Crutcher JM, Lamm SH, Hall TA. Procedures to protect health-care workers from HIV infection: category I (health-care) workers. *Am Ind Hyg Assoc J* 1991;52:A-100–3.
- World Health Organization. Occupational health [Internet], 2021. Available: <https://www.who.int/health-topics/occupational-health>
- The Lancet COVID-19: protecting health-care workers. *The Lancet* 2020;395:922.
- McDiarmid MA. Hazards of the health care sector: looking beyond infectious disease. *Ann Glob Health* 2014;80:315.
- Coggon D, Harris EC, Poole J, et al. Mortality of workers exposed to ethylene oxide: extended follow up of a British cohort. *Occup Environ Med* 2004;61:358–62.
- Ratner PA, Spinelli JJ, Beking K, et al. Cancer incidence and adverse pregnancy outcome in registered nurses potentially exposed to antineoplastic drugs. *BMC Nurs* 2010;9:15.
- Vaughan TL, Stewart PA, Teschke K, et al. Occupational exposure to formaldehyde and wood dust and nasopharyngeal carcinoma. *Occup Environ Med* 2000;57:376–84.
- Arif AA, Delclos GL. Association between cleaning-related chemicals and work-related asthma and asthma symptoms among healthcare professionals. *Occup Environ Med* 2012;69:35–40.
- Trapé M, Schenck P, Warren A. Latex gloves use and symptoms in health care workers 1 year after implementation of a policy restricting the use of powdered gloves. *Am J Infect Control* 2000;28:352–8.
- Maslach C. Burnout in health professionals. In: Ayers S, Baum A, McManus C, et al, eds. *Cambridge Handbook of Psychology, Health and Medicine* [Internet]. 2nd ed. Cambridge University Press, 2001: 427–30. https://www.cambridge.org/core/product/identifier/CBO9780511543579A106/type/book_part
- Davis KG, Kotowski SE. Prevalence of musculoskeletal disorders for nurses in hospitals, long-term care facilities, and home health care: a comprehensive review. *Hum Factors* 2015;57:754–92.
- Phillips JP. Workplace violence against health care workers in the United States. *N Engl J Med* 2016;374:1661–9.
- Centers for Disease Control and Prevention. *National Institute of occupational health and safety. State of the sector: healthcare and social assistance*. Atlanta, GA, USA, 2009.
- Liese B, Dussault G. *The state of the health workforce in sub-Saharan Africa: evidence of crisis and analysis of contributing factors*. Washington, DC, USA: The World Bank, 2004.
- Ministry of Health, Ghana Health Service. *Occupational health and safety policy and guidelines for the health sector*. Ghana, 2010.
- Nuwayhid IA. Occupational health research in developing countries: a partner for social justice. *Am J Public Health* 2004;94:1916–21.
- Patwary MA, O'Hare WT, Sarker MH. Assessment of occupational and environmental safety associated with medical waste disposal in developing countries: a qualitative approach. *Saf Sci* 2011;49:1200–7.
- Rai R, El-Zaemey S, Dorji N, et al. Exposure to occupational hazards among health care workers in low- and middle-income countries: a scoping review. *Int J Environ Res Public Health* 2021;18:2603.
- Mossburg S, Agore A, Nkimbeng M, et al. Occupational hazards among healthcare workers in Africa: a systematic review. *Ann Glob Health* 2019;85:78.
- Auta A, Adewuyi EO, Tor-Anyiin A, et al. Health-care workers' occupational exposures to body fluids in 21 countries in Africa: systematic review and meta-analysis. *Bull World Health Organ* 2017;95:831–41.
- Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19–32.
- Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. *Implement Sci* 2010;5:69.
- Corporation for Digital Scholarship. Zotero | Your Personal research assistant [Internet], 2021. Available: <https://www.zotero.org/>
- Ouzzani M, Hammady H, Fedorowicz Z, et al. Rayyan-a web and mobile app for systematic reviews. *Syst Rev* 2016;5:210.