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Healthcare-associated infections (HAI) and prescribing of antibiotics in hospital inpatients in the Caribbean Community (CARICOM) states: a mixed methods systematic review

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Review question

1. How is the burden of HAI evaluated in hospital inpatients of CARICOM states?
2. How is acceptability and effectiveness of interventions to reduce HAI in hospital inpatients assessed in CARICOM states?
3. What are the methods used to assess the prescribing of antibiotics in hospital inpatients of CARICOM states?
4. How is the appropriateness and acceptability of interventions used to improve the prescribing of antibiotics in hospital inpatients of CARICOM states evaluated?
5. What is known about the limitations and barriers of conducting studies on HAI, and prescribing of antibiotics in hospital settings in CARICOM states?

Searches

The websites of the Pan American Health Organization (PAHO)-Virtual Health Library [<https://www.who.int/library/databases/paho/en/>], Ovid MEDLINE, Global Health (OvidSP), Global Health Library-Global Index Medicus (LILACS) [<http://LILACS.bvsalud.org/en/>], Caribbean Public Health Agency (CARPHA)[<http://carphaevidenceportal.bvsalud.org/>], Proquest Dissertations and Theses Global, Oxford Research Archives (ORA) [<https://ora.ox.ac.uk/>] and EMBASE (OvidSP) will be searched for studies, and conference abstracts where applicable, from their inception date to March 2019. The Cochrane Database of Systematic Reviews (Cochrane Library, Wiley)[<https://www.cochranelibrary.com/cdsr/reviews>] will be examined for existing reviews, and The International Prospective Register of Systematic Reviews (PROSPERO) [<https://www.crd.york.ac.uk/prospero/>] will be searched for ongoing systematic reviews. Reference lists of included studies will be scanned for eligibility. The search strategy will be adapted to different databases. There will be no date or language restrictions, and both published and unpublished literature will be considered for inclusion.

Types of study to be included

All primary research of qualitative, quantitative and mixed methods study designs will be included if they looked at:

- The overall burden of HAI/nosocomial infections/ hospital-acquired infections.
- An evaluation of the burden of individual HAIs of major sites - CAUTI, CLABSI, VAP, SSI, and NS with or without bacteriological pathogen identification
- An evaluation of interventions designed to reduce the burden of HAI.
- An assessment of the prescribing of antibiotics

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- An evaluation of interventions designed to improve the prescribing of antibiotics

Studies will be excluded if they:

- Evaluated HAI caused by fungi, viruses and protozoa
- Case studies
- Solely assessed the antimicrobial profiles of bacterial pathogens
- Exclusively based on community-acquired infections
- Assessed Group B Streptococcus or organisms of maternal origin as the cause of neonatal sepsis

Condition or domain being studied

Healthcare-associated infections (HAI), also referred to as hospital or nosocomial infections, are acquired by patients during visits to or stays in healthcare facilities. HAI jeopardize patient safety and often result in the mortality of high-risk individuals. Several agents, both endogenous and exogenous, are responsible for HAI. HAI: catheter-associated urinary tract infection (CAUTI), ventilator-associated pneumonia (VAP), central line-associated bloodstream infection (CLABSI), surgical site infection (SSI) and neonatal sepsis (NS) are commonly targeted for epidemiological surveillance because of their frequency in hospitals. Many factors increase patients' risk for HAI, including the improper and extended use of invasive medical devices, high-risk procedures, inadequate knowledge of infection control procedures and the inappropriate use of antibiotics. Furthermore, the ill-suited utilisation of antibiotics in hospitals is of significance in the emergence of drug-resistant bacteria which are repeatedly implicated in HAI.

Participants/population

The review will consider studies with:

1. Patients who acquired an HAI.
2. Healthcare workers with patient care duties. Healthcare workers with authority to prescribe antibiotics.

Intervention(s), exposure(s)

The review will consider studies whose participants were:

1. Hospitalised for more than 48hrs. Exposed to invasive medical devices and surgery.
2. Hospital employed.

Comparator(s)/control

Not applicable

Context

Research done in the 15 full member States of the Caribbean Community (CARICOM)- Antigua and Barbuda, Barbados, Bahamas, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St Vincent and the Grenadines, Suriname, Trinidad and Tobago

Main outcome(s)

Quantitative component- A synthesis that includes the type of studies, patient characteristics, healthcare worker (HCW) characteristics, type of measurements, and type of reported outcomes- both primary and secondary, in studies with focus on HAI and the prescribing of antibiotics in hospital settings of CARICOM states.

Qualitative component- A synthesis of findings from studies that documented the appropriateness, acceptability, and HCW own viewpoints of interventions used in hospital-based studies on HAI and the prescribing of antibiotics in CARICOM states.

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A combined narrative synthesis of the qualitative and quantitative components.

Additional outcome(s)

A thematic synthesis of the limitations and barriers of conducting studies on HAI and the prescribing of antibiotics in hospital settings of CARICOM states.

Data extraction (selection and coding)

Two search strategies were developed and will be adapted for use across all selected databases for both the qualitative and quantitative components. One search will focus on HAIs while the other will explore the prescribing of antibiotics in hospital settings.

We will develop two data extraction sheets, one for qualitative studies and one for quantitative studies, using Microsoft Excel, pilot it on three studies of each study type, then modify it based on feedback. From included studies, one reviewer (TW) will extract information such as patient characteristics, HCW characteristics, study location, type of infection, study design, methods and measurements used, duration of study and healthcare worker feedback on interventions. Extracted data will be entered in the piloted forms which will be in a tabular format. A second reviewer (DC) will independently examine the data extracted from eligible studies, and a third reviewer (TBD) will resolve differences. RefWorks will be used to manage references.

Risk of bias (quality) assessment

The Mixed Methods Appraisal Tool (MMAT) will be used to assess the risk of bias and quality of each selected study. Two reviewers (TW & DC) will independently assess the risk of bias and a third reviewer (TBD) will assist in resolving any disagreements. All selected studies will be included in the review irrespective of the risk of bias. The methods of studies with better quality evidence will be considered for use in future studies, and for studies of lower quality, weaknesses will be assessed, and improvements will be suggested for future projects. The reporting of this review will follow the Preferred Reporting Items for Systematic reviews (PRISMA) guidelines and ENhancing Transparency in REporting the synthesis of Qualitative research (ENTREQ) statement where appropriate.

Strategy for data synthesis

Narrative description of the outcomes is planned. In this mixed methods review, data from qualitative and quantitative studies will be tabulated in separate forms, and both types of data will be synthesised separately according to the Joanna Briggs Institute (JBI) mixed methods protocol. The quantitative synthesis will be a narrative synthesis that will describe types of studies, methods, measurements, and outcomes that have been used in CARICOM states when conducting studies on HAI and the prescribing of antibiotics. The qualitative synthesis will include a thematic analysis to: identify facilitators and barriers of performing studies on HAI and prescribing of antibiotics, and acceptability and appropriateness of interventions targeted to reduce the burden of HAI and improve prescribing of antibiotics. The qualitative and quantitative components will then be integrated by a methodology like the one described by Harden in 2010 where themes arising from the qualitative assessments will be used to probe the quantitative evidence and explain the absence of evidence.

Analysis of subgroups or subsets

None planned.

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Conflicts of interest**Language**

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Antigua and Barbuda, England

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Review_Ongoing

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Subject indexing assigned by CRD

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Anti-Bacterial Agents; Caribbean Region; Cross Infection; Ethnic Groups; Humans; Inpatients; West Indies

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Details of any existing review of the same topic by the same authors**Stage of review at time of this submission**

Stage	Started	Completed
Preliminary searches	Yes	No
Piloting of the study selection process	Yes	No
Formal screening of search results against eligibility criteria	No	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

Versions

01 April 2019

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