

Identifying Performance Factors of Long-Term Care Facilities in the Context of the COVID-19 Pandemic: A Scoping Review Protocol

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Protocol

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Abstract

Background: Long-term care facilities (LTCFs) in many countries around the world have been severely affected by the COVID-19 pandemic, leading to serious consequences for the elderly living in these facilities. Though many LTCFs experienced high case and death rates due to COVID-19, other facilities performed better, and experienced lower rates. A comprehensive understanding of performance factors affecting the transmission of COVID-19 within LTCFs is still lacking, as no published review has provided a complete perspective of LTCF management utilizing a multifactorial conceptual framework to evaluate performance during the pandemic. Recent research has consisted of strategies for infection prevention and control or studies reporting specific outcomes such as COVID-19 case and death rates within LTCFs. To address these gaps, this scoping review will identify and investigate performance factors that have affected the management of the COVID-19 pandemic in LTCFs using a multifactorial conceptual framework of performance.

Methods: The CINAHL, MEDLINE (Ovid), CAIRN, Science Direct, and Web of Science databases will be searched. Included articles will have been published in a peer-reviewed journal, in English or French, between January 1st, 2020, and December 31st, 2021. They will discuss the review's population (LTCFs), concept (dimensions of performance according to a modified version of the *Ministère de la santé et des services sociaux du Québec* conceptual framework), and context (COVID-19), as well as facilitators and barriers affecting performance of LTCFs. Each article will be screened by a minimum of two authors in an independent manner, after which the data from selected articles will be extracted by one author and then reviewed by the principal investigator.

Results: The results will be presented both narratively and with visual aids (i.e., flowcharts, tables, conceptual maps).

Discussion: A comprehensive understanding of the factors affecting performance within LTCFs could lead to improved infection prevention and control measures for the rest of the COVID-19 pandemic and assist in the proper management of future pandemics or infection outbreaks. Information on this topic could therefore lead to an improvement in the care and security of LTCF residents and personnel.

Registration: Research Registry ID: [researchregistry7026](https://www.researchregistry.com/record/researchregistry7026)

Background

In March of 2020, the World Health Organization (WHO) officially declared the COVID-19 virus a pandemic and emphasized concern over the severity of the virus (1). Since the beginning of the pandemic, long-term care facilities (LTCFs) in many countries around the world have been disproportionately affected by COVID-19, resulting in dire consequences for the elderly living in those facilities (2, 3). The WHO reported that, as of October 2020, over half of the COVID-19 deaths in Europe occurred in residents of LTCFs (4). In the United States, though residents of LTCFs represent 0.6% of the population, they accounted for 42% of COVID-19 deaths between the beginning of the pandemic and August of 2020 (5). Further, between March

2020 and July 2020, LTCF resident deaths made up 78.4% of all COVID-19 deaths in Canada (6), while in the province of Québec, 92% of COVID-19 deaths were individuals 70 years and older, 64.4% of them living in LTCFs (7). Due to the elevated death rates in LTCFs, organizational modifications occurred in many facilities, leading residents to experience drastic changes in their daily lives, often resulting in isolation. Examples include significant decreases in in-person family visits (8), and the reduction and/or elimination of group activities and opportunities for interaction among residents (9), which have both been associated with increased levels of negative mental health outcomes (8, 10) .

In the context of COVID-19, different researchers have attempted to identify potential factors that influence outcomes in LTCFs, such as case rates and death rates. The negative impact of certain factors, such as staffing challenges (which leads to significant overtime for many employees and reduced levels of care for residents) (11), and differences in the baseline characteristics of the existing long-term care sector (such as number of health workers per 100 LTCF residents) (12), has been highlighted. Likewise, many factors that positively influence outcomes have been identified, such as the earlier implementation of more robust policies concerning infection prevention and control (IPC) practices in LTCFs and in surrounding communities (6) as well as increased government response and policy implementation related to COVID-19 (12). Research has also shown that LTCFs with a lower crowding index (13) and LTCFs where residents received more daily hours of direct care (14) experienced fewer resident deaths. Additionally, qualitative research has been undertaken to gain a deeper understanding of potential factors affecting the responses of LTCFs to COVID-19, with key informants interviewed about their personal experiences working in diverse roles (e.g., nurses, directors, care aides, etc) in LTCFs. They highlighted factors such as the early identification and response to new COVID-19 cases, describing how facilities with higher suspicion for COVID-19 and lower thresholds for testing (i.e., more likely to test residents and employees who exhibited mild or nonrespiratory symptoms) displayed greater success at preventing the spread of COVID-19 (11). Organizational factors, such as personnel training and education, workplace culture, organizational leadership, and management were deemed as factors as well, including how the provision of up-to-date IPC knowledge for personnel members helped to better prepare certain facilities for the pandemic (11).

As mentioned above, several factors can influence the outcomes of COVID-19 in LTCFs. However, even if many LTCFs experienced high death rates due to COVID-19, other facilities managed to perform better and experience lower death rates. A comprehensive understanding of factors affecting the transmission of COVID-19 within LTCFs is still lacking, as is why some perform better than others (4, 13). In the context of the pandemic, performance in LTCFs has been often defined as case rates and death rates (15, 16), but, in the health care field, performance can be defined and evaluated in numerous ways. Many conceptual frameworks have been developed by researchers, governments, and organizations to evaluate performance within the health care setting, varying in their components and in how they provide their unique definition of performance. The Organization for Economic Co-operation and Development (OECD) framework (17) defines performance as successfully reaching goals at the lowest possible cost to the health care system, and the Canadian Institute for Health Information framework (18) evaluates performance by considering two questions, “How healthy are Canadians?” and “How healthy is the health

system?”. In Québec, the *Ministère de la Santé et des Services Sociaux* (MSSS) has developed a conceptual framework which defines performance within health care as a health system that reaches its objectives in terms of the health and well-being of the population, while simultaneously considering the accessibility of services, the quality of services and the optimization of resources (19). This framework has been chosen for this review due to its inclusion of these additional elements which results in a multidimensional approach to the concept of performance.

The significant human impact on both residents and employees of LTCFs caused by the COVID-19 pandemic, as well as the gap in the literature relating to the identification of performance factors in LTCFs, are the motivation behind the undertaking of this scoping review. The emphasis of recent research has been on publishing guidelines (20) and discussing mitigation strategies (21, 22) related to IPC, as well as on studies that report specific outcomes such as COVID-19 death rates and case numbers within LTCFs. One study (23) discusses performance in LTCFs within the context of COVID-19, defining performance in terms of how facilities scored on a ranking system (created by the Centers for Medicare & Medicaid Services) that considers three domains: health inspections, quality measures, and nurse staffing. Despite these works, research that provides a comprehensive perspective of LTCF management and performance during the COVID-19 pandemic is lacking.

After the completion of a preliminary search of the literature for reviews in both the CINAHL and MEDLINE databases in September 2021, a few examining different elements of the COVID-19 pandemic in LTCFs were found. Thompson et al. (24) provide an overview of COVID-19 in LTCFs internationally, and include detailed discussions of death rates in many regions of the world, with the goal of identifying potential causes of outbreaks and providing solutions to limit them. These causes and recommendations, however, are limited to broad elements, such as inadequate personnel training and personal protective equipment supply, or the need to implement a screening system for residents. An examination of government policies implemented during the pandemic was undertaken by Chen et al. (25), with the goal of aiding in the creation of future evidence-based regulations. However, the review focuses on describing the policy changes, and not on examining the consequences of them on the management of LTCFs. A recent scoping review focusing on COVID-19 within LTCFs examines factors that increased the spread and mortality of the virus (26). Contrary to the scoping review that will be undertaken by this team, it limits its search for articles to only one database and does not attempt to define or explore the concept of performance. Based on the literature, no scoping review examining the impact of performance on the management of COVID-19 in LTCFs using a specific conceptual framework has been undertaken from a multi-factorial perspective. The knowledge brought about by a comprehensive understanding of the many factors affecting performance within LTCFs could lead to improved IPC measures for the remainder of the COVID-19 pandemic and could also be generalized to assist in the proper management of future infection outbreaks or pandemics. Information acquired on this topic could therefore lead to an improvement in the quality of health care and security experienced by both present and future LTCF residents and personnel.

Aims and Objectives:

Aim:

The aim of this scoping review is to identify and investigate performance factors that have influenced the management of the COVID-19 pandemic in LTCFs using a multifactorial conceptual framework of performance.

Specific objectives:

1. Identify the facilitators reported to have influenced the performance of LTCFs since the onset of the COVID-19 pandemic.
2. Identify the barriers faced by LTCFs reported to have influenced their performance since the onset of the COVID-19 pandemic.
3. Identify key gaps in existing data and the most pressing questions for future research.

Methods

Design

This review will be formatted according to the scoping review framework developed by the Joanna Briggs Institute (8), which expands on previous work developed by Arksey & O'Malley and Levac et al. (27, 28). The JBI framework is comprised of nine essential steps: 1) defining and aligning the objective/s and question/s, 2) developing and aligning the inclusion criteria with the objective/s and question/s, 3) describing the planned approach to evidence searching, selection, data extraction, and presentation of the evidence, 4) searching for the evidence, 5) selecting the evidence, 6) extracting the evidence, 7) analysis of the evidence, 8) presentation of the results, and 9) summarizing the evidence in relation to the purpose of the review, making conclusions and noting any implications of the findings. The Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) checklist has also been used in the preparation of this protocol, to ensure the inclusion of all necessary elements (see Additional File 1) (29). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) has been consulted, as well, since the PRISMA-P checklist is not specifically tailored to scoping reviews (see Additional File 2) (30). Certain updates made to the general Preferred Reporting Items for Systematic Reviews and Meta-Analysis statement in 2020 (31) also have implications regarding the reporting of scoping reviews, and following the guidance of the JBI, these updated guidelines will be followed as well (32).

Inclusion Criteria

1. **Population:** LTCFs
2. **Interest:** Factors (facilitators and barriers) influencing the performance of LTCFs
3. **Comparison:** Not applicable
4. **Outcome:** Performance of LTCFs

a. Accessibility of services

- i. Accessibility: Ability to provide required care and services, when and where they are needed
 - ii. Equity: Ability to provide care and services according to need without regard for personal characteristics not related to one's needs, such as income, education, area of residence, etc.
- b. Quality of services

- i. Continuity: Ability to provide the care and services required, in an integrated and coordinated way
- ii. Reactivity: Ability to adapt to the expectations, values, and rights of the residents (adaptability and satisfaction)
- iii. Effectiveness/Efficacy: Ability to improve the health and well-being of residents
- iv. Security/Safety: Ability to minimize the risks associated with interventions and with the environment for residents

c. Optimization of resources

- i. Efficiency: Ability to use the available resources (human, material, financial, technological, and informational) optimally
- ii. Viability: Ability, considering human, material, financial, technological, and informational resources, to respond to the present and future needs of the population (resource management and resource mobilization)

d. Quality of care

- i. Structures: Resources, physical layouts, structural elements (committees, teams) that can directly or indirectly influence the quality of care in terms of IPC
- ii. Care procedures: Standards and practices that underpin professional activities and the use of evidence-based guidelines in terms of IPC
- iii. Results: Improvements or changes in the patient's state of health that can or are believed to be attributed to the care and services received (e.g., nosocomial infection rates)

5. Time: context of the COVID-19 pandemic (2020 to present)

Conceptual Frameworks

To guide the collection and analysis of data, as well as the synthesis and presentation of results (33), the scoping review will follow the *Cadre de référence ministériel d'évaluation de la performance du système public de santé et de services sociaux à des fins de gestion* (19) as its primary conceptual framework. This framework identifies and outlines performance factors that can influence management within the public health care setting, which will be evaluated in the context of LTCFs in this scoping review. It includes three main dimensions of performance: the accessibility of services, the quality of services, and the optimization of resources. This framework has been slightly modified, through the addition and adaptation of certain sub concepts, to further enhance its pertinence to the specific topic of the scoping review. After examining the descriptors of the CINAHL database and discovering that the definition of *reactivity* provided did not correspond to the definition of reactivity from the MSSS framework, the sub

concept of *reactivity* was replaced with *adaptability* and *satisfaction*. This replacement avoids a discrepancy that would have resulted from the lack of consistency between the MSSS framework's definition of performance and some of the articles found in our searches. In addition, the definitions of the descriptor terms *adaptability* and *satisfaction* from the CINAHL database were found to better correspond to the MSSS framework definition, thus, *adaptability* and *satisfaction* will be used in all database searches. For the same reason, this process also resulted in the MSSS sub concept of *viability* being replaced with the CINAHL descriptors *resource management* and *resource mobilization*. Additionally, whenever synonyms of the MSSS sub concepts were found within the CINAHL descriptors, they were added as sub concepts to capture all relevant articles. This led to the sub concepts of *effectiveness* and *safety* being added to the quality of services dimensions within our adapted framework, as they are synonyms of *efficacy* and *security*, respectively.

Considering that the MSSS framework is not specifically structured to consider infection prevention and control, and that the context of this review is the COVID-19 pandemic, the authors wanted to ensure the proper consideration of IPC measures within the conceptual evaluation of performance used. This led to the fusion of information from the *La prévention et le contrôle des infections nosocomiales* (PCI) guideline, which was also developed by the Ministry of Health and Social Services of Québec, into the existing MSSS framework. The PCI guideline, which is centered around the prevention and control of infections, considers organizational and physical elements of the environment of care, and focuses on how resources, the physical layout, and the structural elements (including personnel members) of a health care setting can directly or indirectly affect the quality of health care when it comes to infection prevention and control (34). This modified version of the MSSS conceptual framework (represented in Fig. 1) will help to better capture the complex, interconnected elements that all help to explain the performance of LTCFs in the context of the COVID-19 pandemic.

Data Sources and Research Strategy

This scoping review protocol was registered with the Research Registry (researchregistry7026: <https://www.researchregistry.com/browse-the-registry#home/registrationdetails/6109a98e7fdaf6001ecffe67/>). Articles will be selected from the scientific literature. Five online databases will undergo electronic searches in the fall of 2021 for this review: CINAHL, MEDLINE (Ovid), CAIRN, ScienceDirect, and Web of Science. A summarized search strategy for the CINAHL database has been included as an additional file (see Additional File 3). The articles that will be included in the review will discuss the review's population (LTCFs), concept (dimensions of performance, i.e., accessibility of services, quality of services, optimization of resources, and quality of care), context (COVID-19), as well as facilitators and barriers affecting the performance of LTCFs. Included articles will have been published in a peer-reviewed journal in either English or French, between January 1st, 2020, and December 31st, 2021.

Exclusion criteria

- Research published in any language other than English or French

- Research focusing on infections other than COVID-19
- Research focusing on care contexts other than LTCFs
- Research focusing on pharmaceutical research examining treatments received by LTCF residents during the pandemic
- Research focusing on COVID-19 vaccination rates within LTCFs.

The databases will be searched using descriptors with the Boolean operators 'AND' and 'OR', using our search strategy which was developed and defined in collaboration with all review team members. Searches of the chosen databases will be conducted by two of the authors (JL, EB), independently, after which results will be compared for consistency. Articles found in the searches will then be imported into the EndNote software, at which point all duplicates will be removed.

Selection Process

All articles will be imported into the Rayyan web platform (35) for the article selection process. Authors will independently complete the article selection process, using a screening algorithm (see Fig. 2) previously developed by members of the research team involved in this review (3). Prior to beginning the official selection process, a pilot test will occur, to ensure the reliability of the algorithm screening tool and the article selection process itself. All authors of the review will screen the titles and abstracts of the first 10% of articles found for eligibility and will then compare results in a group meeting to discuss the presence of any discrepancies and subsequent potential modifications to the screening algorithm or screening process. The official selection process will then take place, which will involve all the articles being divided among the co-authors, with each article being examined by at least two authors. Half of the articles will be reviewed by two of the authors (JL, EB), while the other half of the articles will be split between all the other authors involved in the review. The reviewers will first screen the titles and abstracts of the articles for relevancy. If both reviewers classify an article as relevant, it will be included in the review. If one of the reviewers questions the relevancy of an article, a third reviewer (another co-author) will independently review the title and abstract of the article in question and cast the deciding vote. An article will not be included in the review if two of the three reviewers deem it to be non-relevant. Subsequently, three or four of the selected articles will then be read in their entirety by every member of the review team to determine their relevance to the review, after which a meeting will occur to examine the consistency in screening full articles. All the articles will then be read in full by at least two of the authors (JL, EB), at which point an article will be included in the final scoping review if it is found to satisfy the review's criteria. The research strategy and selection process for this review have also been represented visually using a PRISMA flow chart (see Fig. 3) (31).

Data Extraction

All full text articles that satisfy the selection process and are chosen to be included in the scoping review will undergo data extraction. A structured data charting form will be created by the investigators, combining general elements from a template provided by the JBI as well as specific elements from the adapted MSSS framework which are directly related to the topic of the review. The extracted data will include the following information: title and abstract, author, year of publication, publication type, full citations, country of origin, study purpose, type of LTCF, population size (if applicable), study design, performance factors discussed in the articles, facilitators and barriers to performance identified in the article. Prior to the data extraction process, the data charting form will be pilot tested by the investigators, in a similar manner to the article screening algorithm. All team members will extract data from three or four articles using the charting form and then compare results in a group meeting to examine consistency among the results and discuss subsequent potential modifications to the data extraction form. After confirmation of the extraction form, the data from all articles will be extracted by one author (EB) and then reviewed by the principal investigator (JL).

Analysis and presentation of the evidence

Several categories of results related to the selected articles for this review will be presented both narratively and with visual aids. First, a completed PRISMA flowchart will be provided, as Fig. 3 shown above will be updated to reflect the total number of records and reports found and included in each stage of the review. Second, characteristics of the included articles will be analyzed, specifically sociodemographic information, the region of origin, and the type of study/study design. This information will be synthesized and presented in tabular form, to assess the frequency of certain study characteristics among the sample. Third, the dimension(s) of performance found in each article, as well as the relative frequency of each dimension among all the selected articles, will also be presented. Furthermore, articles will be specifically analyzed for factors that act as facilitators or barriers to the management of LTCFs during the pandemic and the relative frequency of those factors within the sample will also be presented. This information will be shared through mapping and will follow the review's conceptual framework for performance.

Review Team

The principal author of this scoping review (JL) is a registered nurse and a post-doctoral fellow in the field of nursing sciences, with specific expertise in the prevention and control of infections, the analysis of performance within a nursing organization, and the evaluation of factors contributing to infection outbreak. This author's expertise is also supported by the experience of several professors (ENT, DS, IB) who are experts in the completion of scoping reviews within the field of nursing sciences. The review team also includes research professionals (EB, SR, KK), and a nurse who is a doctoral student in the field of nursing sciences (MJ), who are proficient in searching databases and in the article selection process, as well as in the preparation and writing of academic articles.

Consultation

In April of 2021, prior to beginning the initial steps of this scoping review, two of the authors (JL, ENT) consulted with two professors (DS, IB) who possess expertise in completing scoping reviews within the field of nursing sciences. After this consultation to aid in the development of an initial search strategy, the two professors subsequently became co-authors of the review.

Discussion

This protocol will act as the foundation for a scoping review which will identify and investigate performance factors that have affected the management of the COVID-19 pandemic in LTCFs. Information in this area could help to improve IPC measures for both the COVID-19 pandemic and future outbreaks in LTCFs, subsequently improving the health and security of present and future LTCF residents.

Abbreviations

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Infection prevention and control
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LTCFs
Long-term care facilities
MJ
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MSSS
Ministère de la Santé et des Services Sociaux du Québec
OECD
Organization for Economic Co-operation and Development
PRISMA-P
Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols

PRISMA-ScR

Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews
SR

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WHO

World Health Organization

Declarations

Ethics approval and consent to participate

Not applicable, as ethical approval for this review is not required since it will utilize data that has been previously published in peer-reviewed journals.

Consent for publication

Not applicable

Availability of data and materials

Not applicable, as no datasets have been created during the production of this protocol.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

JL, EB, DS, IS, SR, KK, MJ, and ENT were all involved in drafting and revising of this manuscript, and all provided final approval of the version submitted for publication.

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Patient and Public Involvement

This scoping review will not include any patient or public involvement.

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Figures

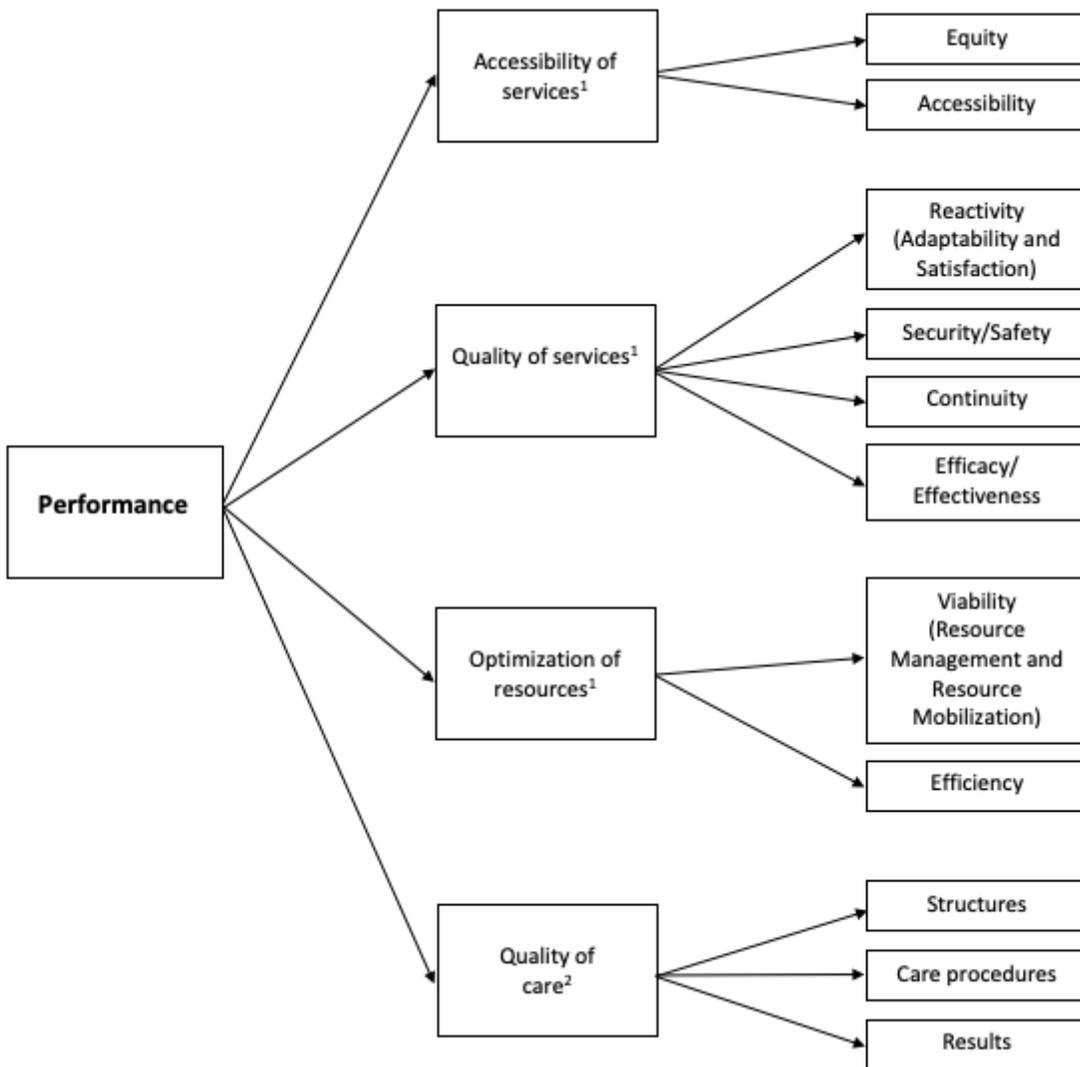


Figure 1

The adapted framework for the conceptualization of performance within a health care system. This framework is based on the Cadre de référence ministériel d'évaluation de la performance du système public de santé et de services sociaux à des fins de gestion (19)¹ framework, and contains elements from the La prévention et le contrôle des infections nosocomiales (34)² framework.

First round screening algorithm

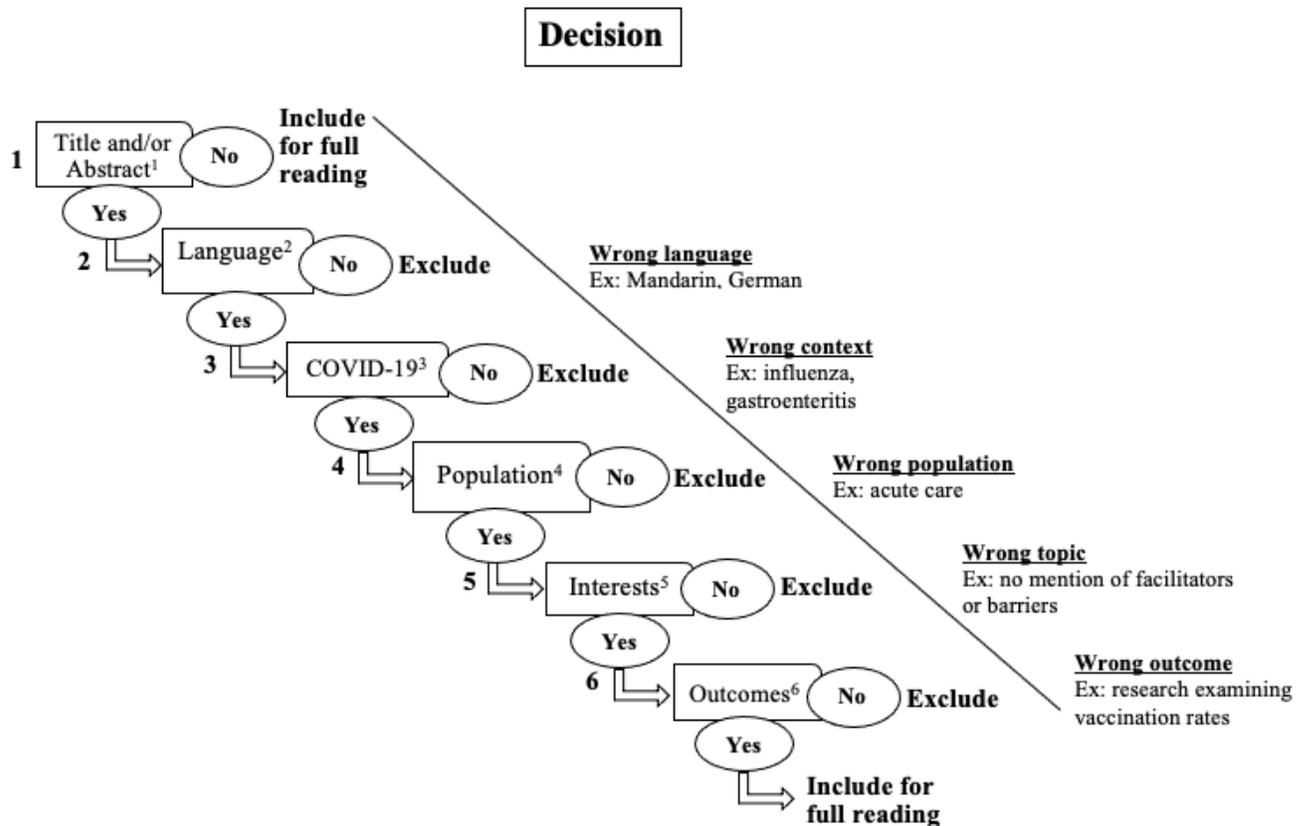


Figure 2

First round screening algorithm, taken from previous work by Tchouaket et al. (3). Legend: 1The reference has a TITLE and/or an ABSTRACT. 2The article is written in English or French. EXCLUDED: Articles written in all other languages. 3COVID-19: COVID-19, coronavirus, 2019-ncov, sars-cov-2, cov-19, covid. EXCLUDED: All other infections (e.g., influenza, gastroenteritis). 4Population: Long-term care facilities, nursing homes, assisted-living facilities, homes for the aged, retirement homes, nursing homes, long term care. EXCLUDED: Acute care, hospital setting, ambulatory setting. 5Interests: Factors (facilitators and barriers) identified as affecting the performance of LTCFs. 6Outcomes: Dimensions of performance (ex: Efficiency, Efficacy, Security, Accessibility, Equity, Continuity, Adaptability, Satisfaction, Resource Management, Resource Mobilization, Structures, Care procedures, Results). EXCLUDED: Pharmaceutical research, vaccination studies.

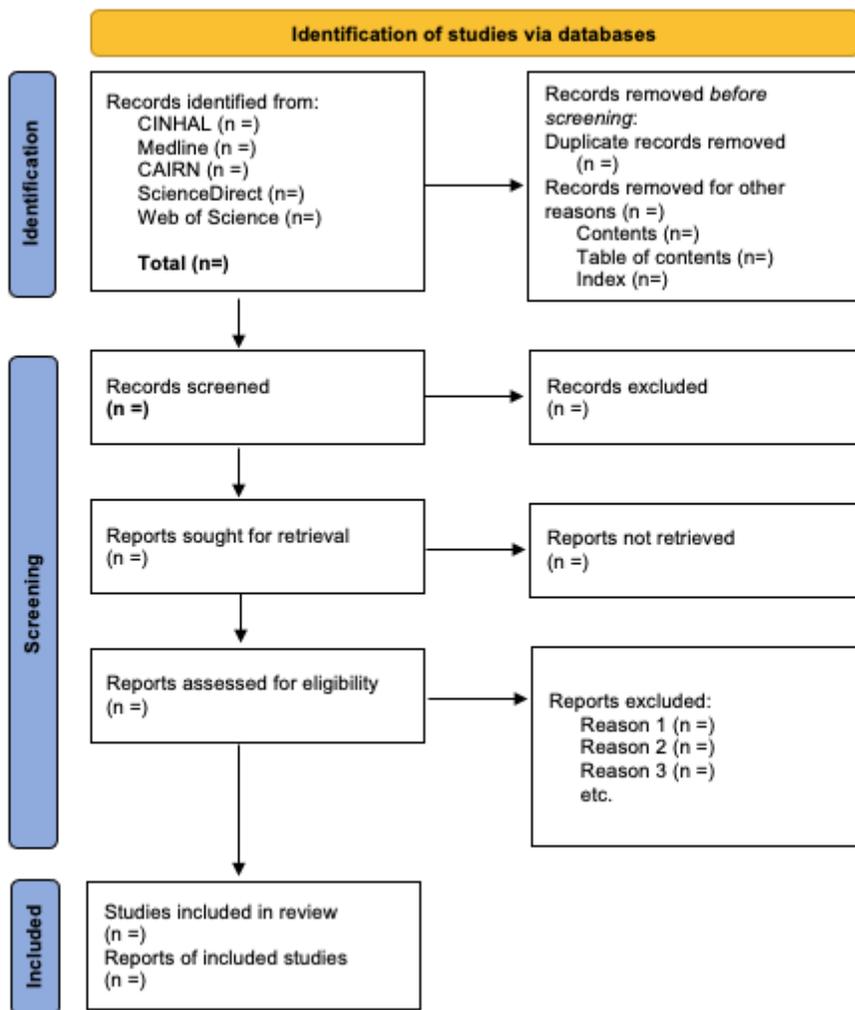


Figure 3

PRISMA flow chart, outlining the identification and selection stages of this review, taken from The PRISMA 2020 statement: An updated guideline for reporting systematic reviews (31). The term “report” signifies a “A document (paper or electronic) supplying information about a particular study”, such as a journal article or government report, while the term “record” signifies “The title or abstract (or both) of a report indexed in a databased or website” (31).

Supplementary Files

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