

Obesity And Severity In Patients With COVID-19: A Scoping Review Protocol

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Protocol

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Abstract

Background: Coronavirus disease (COVID-19), caused by the SARS-CoV-2 strain, was first identified in late 2019, in China. A greater number of countries were affected in 2020, with a consequent increase in the disease's epidemiological curve. The outcomes of patients affected by the virus can worsen, developing acute respiratory failure and other serious complications, especially when related to older individuals and people of all ages with obesity and comorbidities. Some studies have shown that obese infected with COVID-19 had a high frequency risk of hospitalization in the Intensive Care Unit and the need to use Invasive Mechanical Ventilation, in addition to the association between a higher death rate. Thus, obese patients tend to have a more severe course of COVID-19. In this sense, this review aims to synthesize the evidence in the literature that associates COVID-19 and the severity of clinical outcomes in infected obese patients.

Methods: This protocol will include all study articles that can be used as instruments to assess the severity of clinical outcomes in obese patients infected by 2019-nCoV. There will be no time limitation when searching for articles. Studies in any environment or country for inclusion will be considered.

Discussion: There are still not enough studies to characterize the evidence and its strength in the severity of clinical outcomes of the disease. Therefore, given the need for early detection of the possible implications and treatment for patients with obesity, the evidence will be useful for directing the conduct and optimization of therapies in these patients by the multiprofessional teams.

Scoping review registration: Open Science Framework: <https://osf.io/xrkec>

Introduction

Coronavirus disease 2019 (COVID-19), caused by the SARS-CoV-2 strain, was first identified in late 2019, in the city of Wuhan, China, in a group of patients with pneumonia due to an unknown cause(1). A greater number of countries were affected in 2020, with an increasing growth in the epidemiological curve of the disease, officially declared a pandemic by the World Health Organization, on March 11, 2020(2).

As clinical manifestations of people with COVID-19, they can be classified as asymptomatic and symptomatic, generally causing mild symptoms such as fever, cough, sputum production, shortness of breath and headache. However, patients affected by the virus can worsen, developing respiratory failure and other serious complications, especially when related to older individuals and people of all ages with obesity and comorbidities(3–5).

It is understood as obesity the excess of body fat, often associated with non-communicable diseases and conditions such as systemic arterial hypertension and cardiovascular disease(6). Individuals with obesity have an increased risk of hospitalization, severe illness and mortality, possibly associated to cardiovascular comorbidities, chronic inflammatory status and immune response to infection(7). The

immune system is largely related to the inflammation caused by adipose tissue, resulting from obesity, and, therefore, its response is often impaired when associated with obesity(8).

The mechanism which obesity can contribute to complications in COVID-19 is not yet defined, but it is known that several causes can influence the problems, since obese patients present harmful respiratory physiology, including the reduction of the functional residual capacity, as also hypoxemia and ventilation and perfusion abnormalities(9).

Some studies show that obese infected with COVID-19 have a high frequency of admission to the Intensive Care Unit (ICU) and the need of using Invasive Mechanical Ventilation (IMV), in addition to the association between the highest death rates and body mass ratio(10,11). Thus, obese patients tend to have a more severe course of COVID-19. In this sense, this review aims to synthesize how the literature associates COVID-19 with the severity of the clinical outcomes in infected obese patients.

Methods And Analysis

All articles that can be used to assess clinical severity in obese patients with or without comorbidity infected by 2019-nCoV, will be included. There will be no time limit for searching the articles. Studies in any environment or country will be considered.

Protocol

This research will be completed following the methods outlined by the Joanna Briggs Institute's Method Manual for Scoping Review(12). These types of reviews are useful for examining emerging evidence when it is not yet clear and other more specific issues that can be reliably posed and addressed (JBI). The protocol of this Scope Review will be prepared in accordance with the recommendations of the Prisma-P guidelines(13). The protocol was reviewed by the members of the research team. To conduct the research, we will ask for help from another expert to work in collaboration with their librarian, using the PRESS(14) (peer-review of search strategies) checklist.

Framework

The structure will be based on the following points: identify the research question and the relevant studies; select and evaluate the results. This research aims to evaluate the severity of clinical outcomes in obese patients with COVID-19. Recent studies have associated a higher mortality rate and the need for advanced medical care in obese patients.

Eligibility criteria

Any evidence that meets the PICOCS(15) criteria (population, intervention, comparison, outcomes, context, study design) will be included in this review:

Population

- Obese patients (no age limit) infected with COVID-19, with or without comorbidities.

Intervention:

- No intervention is required

Comparison:

- Patients with normal weight

Outcomes:

- Articles that report the severity of clinical outcomes in obese patients, with or without comorbidity, related to SARS-CoV-2 infection.

Context

- Articles published in English, Portuguese and Spanish will be included. There will be no restrictions on the date or range of the publication, because the purpose of the review is to map the existing evidence.

Study design

- This review will consider the designs of experimental studies, including randomized clinical trials, non-randomized clinical trials, expert opinion, cohort study and cross-sectional studies. In addition, analytical observational studies will be considered, including prospective and retrospective cohort studies, case control studies, and cross-sectional analytical studies. This research will also consider descriptive observational study projects, including case series, individual case reports, and descriptive cross-sectional studies, for inclusion. Furthermore, editorials, opinion articles, reviews, systematic reviews, and gray literature will be considered for inclusion.

Exclusion criteria

Articles or studies will be excluded if they cannot be obtained in full-text or if they are not in English, Portuguese and Spanish.

Research strategy

The studies available in the scientific literature will be identified without time limitations using the following databases: PubMed/MEDLINE; Latin American Literature on Health Sciences (Lilacs); Online Scientific Electronic Library (SciELO); Scopus, ScienceDirect, Web of Science, Embase and Cochrane. For identification, a research was conducted with the terms MESH and DECS with the following descriptors: ("covid-19" OR "covid-19 virus infection" OR "SARS-CoV-2 infection" OR "COVID-19 virus disease" OR "severe respiratory acute" OR "syndrome coronavirus 2" OR "severe acute respiratory syndrome coronavirus 2" OR "2019-nCoV" OR "SARS-CoV-2" OR coronavirus) AND (mortality or hospital mortality or

hospital) And comorbid* and obes*. The manual search analyzing the references of the included articles will also be done.

Search process

The titles, abstracts, and articles in full will be evaluated by two independent reviewers. Three categories were used in the selection of the title and abstract and text in full: 'yes', 'no' and 'maybe'. In case of doubts (category 'maybe'), the study will be selected for evaluation of the full text, at this stage, the divergences will be resolved by consensus between the two reviewers. The strategy will be sent to an online platform known as Google Forms. Google Forms will allow authors to collaborate simultaneously. The review team will have training on how to use Google Forms before the study begins to ensure calibration of collection methods. The full search of the data will proceed only with $x > 75\%$ agreement across the team. If it is found below the value, the doubts will be clarified and the training exercise will be repeated. Conflicts will be resolved by a third reviewer. For this stage, it will be carried out a pilot of 20 studies to calibrate the collection method and the level of agreement. The research will be in accordance with the recommendations of PRESS 2015 guidelines(14), according to the following variables: translation of the research question; boolean operators and proximity; subject titles (database-specific); word text search; limits and filters.

Risk of bias assessment

The assessment of the risk of bias will not be carried out because this is a Scoping Review. Our method is in accordance with the Joanna Briggs Institute Manual for Scoping Review(12) on health-related topics.

Data collect

The reviewers are experts in electronic research, systematic review, and Scoping Review. From this action, a collection of studies will be created to be evaluated by the reviewers. Selection divergences will be resolved through a third reviewer and consensus building. Cohen's kappa statistics will be used to measure reliability among evaluators. The information to be extracted will be:

- Identification of studies: place of publication, date of publication;
- Study methodology: study design; when and where it was performed, analysis of the data used, duration of the study and authors.
- Variables collected: body mass index; comorbidities; severe acute respiratory syndrome; renal failure; acute myocardial infarction; invasive mechanical ventilation; liver failure; death;

Statistical analysis

The statistical program SPSS version 17.0 will be used to calculate the kappa index to verify agreement in the selection of studies included among the authors, reducing the chance of a study loss and the possibility of bias.

Results Overview

The evaluation and characterization of the results will make it possible to relate obesity and its characteristics as an exponentially important factor in determining the risk of severity and the associated clinical parameters in patients with SARS-CoV-2. The quantitative results will be presented in a table format, followed by a narrative section containing the main theories collected from observational studies, intervention and expert opinion papers published on the possible causes of the clinical severity in obese patients diagnosed with COVID-19.

Dissemination

This project is part of a research program on COVID-19 and obesity. The results will serve as a basis for the development of treatment strategies for obese patients diagnosed with COVID-19. The idea of this review came through the Nutrition and Obesity research group at the University Hospital of the Federal University of Sergipe. The results of the review will be shared through peer-reviewed publications, presentations, workshops and educational institutions.

Discussion

The Scoping Review seeks to synthesize the research evidence by mapping the existing literature in a field of interest in terms of volume, nature and characteristics of primary research. They are usually carried out to examine the extent, scope and nature of the activity. This type of research shares several processes like systematic reviews, as they use rigorous and transparent methods to comprehensively identify and analyze all literature related to a research question(12,13).

This research will synthesize evidence from the available studies related to obesity and severity of COVID-19. Therefore, in view of the need for early detection of possible implications and treatment for patients with obesity, the evidence will be useful for the conduction direction and optimization of therapies in these patients by multiprofessional teams, given the high frequency of intensive care and high risk of mortality in these patients, in order to improve therapeutic interventions and reduce unfavorable outcomes.

Limitations

The search for studies will be performed in certain databases, which may restrict the inclusion of articles that are not in the selected databases. In addition to the above, there is a limitation to the language, since the search for manuscripts will be done in three languages (Portuguese, English and Spanish), which restricts selection and findings.

List Of Abbreviations

COVID-19: Coronavirus disease

ICU: Intensive Care Unit

IMV: Invasive Mechanical Ventilation

PRESS: Peer-review of search strategies

JBI: Joanna Briggs Institute

PICOCS: (population, intervention, comparison, results, context, study design)

LILACS: Latin American Literature on Health Sciences

SCIELO: Online Scientific Electronic Library

Declarations

Ethical approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

Not applicable

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Authors' contributions

All authors contributed to the manuscript and read and approved the final draft.

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