Citation

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Review question

1. Who are the target population of COVID-19?
2. What are the definitive symptoms of COVID-19 patients?
3. What is the definitive prevention method of COVID-19?
4. What is the definitive method for detecting COVID-19?
5. What is the definitive drug regimen for the treatment of patients with COVID-19?
6. What is the preventive diet for the population without COVID-19?
7. What is the diet that helps in the treatment of patients with COVID-19?
8. Who are the key scientists who have had promising results in responding to COVID-19?
9. What are the symptoms (such as Respiratory distress, Anosmia, Ageusia) that may indicate a higher probability of having COVID-19 among the infected population?

Searches

In the proposed method, initially, an AI-based text mining approach conducts the searches within multitude of abstracts related to COVID-19 (e.g. genes, names of drugs, names of foods, etc.) to automatically rank the keywords related to COVID-19. Then, from among these ranked keywords, it examines the top-ranked keywords in pairs. With this process, a large collection of initial papers is extracted that can be selected as input for the PICO phase.

Subsequently, to find studies related to the research question, the extracted articles are searched for compatibility within the international indices and databases such as ScienceDirect, Web of Science (WoS), ProQuest, Embase, MEDLINE (PubMed), and Scopus. The lower and higher time limits for searching articles related to COVID-19 will be between December 1, 2019 and December 31, 2021.

Given that English is the international language, the search process will look at articles published in English. Therefore, studies published in any other language will be excluded from the search and selection processes. The search strategy in each database will be determined through the Advanced Search feature, using all possible keyword combinations and with the help of 'AND' and 'OR' operators.

Types of study to be included

The inclusion criteria for article selection will be determined and stated in accordance with the type of the posed question, and the purpose of the systematic review. The criteria for inclusion can be, for instance, clinical trial, cohort, case-control and descriptive studies, etc. Similarly, considering the research question and the focus of the review, exclusion criteria will be determined and stated.

Condition or domain being studied

In order to access all relevant studies, the sources of articles that met the inclusion criteria will be manually reviewed. To avoid errors, all steps of the search process, study selection, quality evaluation, and data extraction will be performed independently by 3 reviewers. If there is a disagreement among the reviewers in relation to the exclusion or inclusion of an article, a third reviewer will make the assessment to eliminate any sources of bias.

Inclusion and exclusion criteria according to the research question

The inclusion criteria for article selection will be determined and stated in accordance with the type of the posed question, and the purpose of the systematic review. The criteria for inclusion can be, for instance, clinical trial, cohort, case-control and descriptive studies, etc. Similarly, considering the research question and the focus of the review, exclusion criteria will be determined and stated.

Participants/population

In the proposed method, initially, an AI-based text mining approach conducts the searches within multitude of abstracts related to COVID-19 (e.g. genes, names of drugs, names of foods, etc.) to automatically rank the keywords related to COVID-19. Then, from among these ranked keywords, it examines the top-ranked keywords in pairs. With Keywords will be extracted from the MeSH dictionary according to the PICO instructions. Keywords will be related to the study population (P): Population exposed to COVID-19

Intervention(s), exposure(s)

Keywords will be extracted from the MeSH dictionary according to the PICO instructions. Keywords will be related to the intervention (I): Medication, diet, exercise

Comparator(s)/control

Keywords will be extracted from the MeSH dictionary according to the PICO instructions. Keywords will be related to the comparison (C): Comparison with non- COVID-19 population

Context

The inclusion criteria for article selection will be determined and stated in accordance with the type of the posed question, and the purpose of the systematic review. The criteria for inclusion can be, for instance, clinical trial, cohort, case-control and descriptive studies, etc. Similarly, considering the research question and the focus of the review, exclusion criteria will be determined and stated.

Main outcome(s)

Keywords will be extracted from the MeSH dictionary according to the PICO instructions. Keywords will be related to the outcome (O): Therapeutic effects of COVID-19 in the treatment of patients

Measures of effect

Based on the type of study and its quantitative information, i.e. relative risk, odds ratio, and mean scores, the method of analysis will be examined. To assess heterogeneity among studies, the I^2 test will be adopted. To assess publication bias, Funnel plots and Egger's test at the significance level of 0.05 will be followed. If the sample size is high among the collected studies, the Begg and Mazumdar rank correlation test will be used at the significance level of 0.1. The data will be analyzed within the Comprehensive Meta-Analysis software (version 3), and the significance level of the test will be considered P?0.05.

Additional outcome(s)

Artificial intelligence first forms a network graph between each of the components of COVID-19

Measures of effect

In this section, artificial intelligence first forms a network graph between each of the components of COVID-19 (such as its genes) and the drugs, using text mining. The weight of each edge represents the p-value criterion in the network. The following figure shows an example of this network

Data extraction (selection and coding)

After selecting the studies to enter the process of systematic review and meta-analysis, the data were extracted and the studies were summarized. For this purpose, two electronic checklists (one for the descriptive section and one for the analytical section) were prepared. The various items in the descriptive checklist included: name of the first author, year of publication and year of report, place of study, age, sample size and prevalence, and various items in the analytical checklist including: name of first author, year of publication, place of research, the sample size of the drug group and the placebo group were the type of drug, mean and standard deviation before and after the intervention.

Risk of bias (quality) assessment

In order to evaluate the quality of the studies that are going to be selected for the review process, the CONSORT (Consolidated Standards of Reporting Trials) checklist will be used. CONSORT includes 25

general sections, with each section having sub-sections resulting to a total of 37 sub-sections. The minimum and maximum scores in this checklist are 0 and 37, respectively. Studies with 75% or more of the maximum achievable score (score greater than or equal to 27) with "high quality", studies with a score between 75-50% (score 18-26) as "average quality" and studies with a score lower than 50% (score less than or equal to 17) were considered as "low quality" studies.

The STROBE checklist will be used to review observational studies i.e. cohort, case-control, and cross-sectional. the maximum quality review score of 32 will be considered and articles with a score less than 14 will be considered to be of low quality, and will be therefore excluded from the systematic review.

The Newcastle-Ottawa Scale (NOS) checklist will also be used, when applicable. The Newcastle-Ottawa Scale (NOS) is a similar quality assessment method for observational studies that is recommended within the Cochrane guidelines.

Strategy for data synthesis

Based on the type of study and its quantitative information, i.e. relative risk, odds ratio, and mean scores, the method of analysis will be examined. To assess heterogeneity among studies, the I^2 test will be adopted. To assess publication bias, Funnel plots and Egger's test at the significance level of 0.05 will be followed. If the sample size is high among the collected studies, the Begg and Mazumdar rank correlation test will be used at the significance level of 0.1. The data will be analyzed within the Comprehensive Meta-Analysis software (version 3), and the significance level of the test will be considered P?0.05

Analysis of subgroups or subsets

In this section, artificial intelligence first forms a network graph between each of the components of COVID-19 (such as its genes) and the drugs, using text mining. The weight of each edge represents the p-value criterion in the network. The following figure shows an example of this network

Contact details for further information

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Type and method of review

Epidemiologic, Meta-analysis, Methodology, Network meta-analysis, Systematic review

Anticipated or actual start date

25 May 2021

Anticipated completion date

22 June 2021

Funding sources/sponsors

None.

Conflicts of interest

Language

English

Country

England, Iran

Stage of review
Review Ongoing

Subject index terms status
Subject indexing assigned by CRD

Subject index terms
Artificial Intelligence; COVID-19; Humans; Network Meta-Analysis; SARS-CoV-2

Date of registration in PROSPERO
25 May 2021

Date of first submission
24 May 2021

Stage of review at time of this submission
The review has not started

Stage	Started	Completed
Preliminary searches	No	No
Piloting of the study selection process	No	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

The record owner confirms that the information they have supplied for this submission is accurate and complete and they understand that deliberate provision of inaccurate information or omission of data may be construed as scientific misconduct.

The record owner confirms that they will update the status of the review when it is completed and will add publication details in due course.

Versions
25 May 2021