

# Telehealth interventions in the context of the COVID-19 pandemic: Protocol for a scoping review

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## **ABSTRACT**

**CONTEXT AND OBJECTIVE:** The current health crisis due to COVID-19 is forcing us to profoundly rethink our social organizations and practices in health. While there is no effective treatment for the virus, staying home and social isolation are the control measures recommended by health authorities. The aim of this study is to perform a scoping review in order to summarize the current evidence in telehealth for COVID-19.

**METHODS:** This study is a protocol to describe the rationale, hypothesis and planned methods of our scoping review. We will include randomized controlled trials (RCTs), observational cohort studies, case-control studies, cross-sectional studies, qualitative studies, and/or case series that describe telehealth interventions applied or developed to respond to COVID-19. We will search Medline via PubMed, Embase via Elsevier, Cochrane Library - Cochrane Central Register of Controlled Trials (CENTRAL), Portal Regional BVS - LILACS, and Scopus. We will include studies performed since December 2019 with no language restrictions. We will use the Risk of Bias tool and the Newcastle-Ottawa Scale to perform the critical appraisal of included studies. We will assess the certainty of evidence using the Grading of Recommendations Assessment, Development and Evaluation (GRADE).

**Key-words:** COVID-19; Telehealth; Telemedicine, Technologies; COVID-19.

## **INTRODUCTION**

The world is currently under the threats of Coronavirus Disease 2019 (COVID-19) pandemic (1). The rapid spread of the disease has overwhelmed health care systems worldwide. The most important challenge in COVID-19 pandemic seems to be the high transmissibility. Therefore, reducing the speed of transmission may reduce the burden on health systems. Telemedicine emerges as a viable strategy that can expand access and bring medical attention to the needy and to people living in remote areas (2). It is an approach that may be useful for screening, diagnosing and monitoring patients with several conditions (3).

As no treatment has been proven to be effective, social distancing is currently the best defense against COVID-19 (4). Social distancing measures have rapidly changed how physicians assess and interact with patients (5). Many providers have appropriately cancelled non-emergent procedures and converted ambulatory appointments to remote video visits or phone calls (5). Telehealth applications have also been developed, aiming at screening and monitoring people who are suspected of having COVID-19 (6).

With the global emergency scenario, huge efforts have been made, also in the scientific world. New studies about COVID 19 are being published daily and scientific evidence is constantly being updated. This exponential production, however, has a contradiction: the development of inaccurate information or of low scientific reliability, hindering the decision-making process and the appropriate allocation of resources. As for the professionals who are on the front line fighting the pandemic and to health managers, synthesizing all this information may not be viable and is frequently not adequate. Therefore, we aim to perform a scoping review in order to summarize the current evidence in telehealth for COVID-19.

## **METHODS**

### **Design**

This protocol aims to describe the planned methods of our scoping review. It will be reported in accordance with the Extended Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement for Scoping Reviews (PRISMA-ScR) (7).

### **Eligibility criteria**

We will include randomized controlled trials (RCT), cohort studies, case-control studies, cross-sectional studies, and/or case series that describe telehealth applications for fighting COVID-19 pandemic. We will consider all patients using any category of telehealth applications, without any restriction related to modality of intervention, age or sex of the participants. Software, online programs, social media pages, video education, mobile applications, or other similar information and communication technology applied or developed to screen, diagnose or monitor COVID-19 patients will be considered.

#### *Outcome measures*

- Primary outcomes: Effectiveness of diagnostic and prognostic evaluation, Hospitalization rate
- Secondary outcomes: Adherence; Feasibility; Users satisfaction; cost; self-management and self-efficacy

### **Data sources and searches**

We will search Medline via PubMed, Embase via Elsevier, Cochrane Library - Cochrane Central Register of Controlled Trials (CENTRAL), Portal Regional BVS - LILACS, and Scopus using relevant descriptors and synonyms, adapting the search to the specifications of each database to identify published, ongoing, and unpublished studies. We will include studies performed since November 2019. No language restrictions will be used in the selection.

We will also search the following COVID-19 specific databases: Epistemonikos COVID-19 L-OVE platform; ClinicalTrials.gov; The World Health Organization International Clinical Trials Registry Platform (WHO ICTRP).

Additionally, we will apply the technique of snowballing, searching the lists of references of the included studies

## Search strategy

We will use the terms related to the problem of interest, the intervention and the filter the date of publication. The search strategy in Medline via Pubmed is shown in Table 1.

**Table 1.** Systematic review Search Strategy

Number	Combiners	Terms
1	Problem of interest	"COVID-19" [Supplementary Concept OR (COVID 19) OR (COVID-19) OR (2019-nCoV) OR (nCoV) OR (Covid19) OR (SARS-CoV) OR (SARSCov2 or ncov*) OR (SARSCov2) OR (2019 coronavirus*) OR (2019 corona virus*) OR (Coronavirus (COVID-19)) OR (2019 novel coronavirus disease) OR (COVID-19 pandemic) OR (COVID-19 virus infection) OR (coronavirus disease-19) OR (2019 novel coronavirus infection) OR (2019-nCoV infection) OR (coronavirus disease 2019) OR (2019-nCoV disease) OR (COVID-19 virus disease) OR "severe acute respiratory syndrome coronavirus 2" [Supplementary Concept] OR (Wuhan coronavirus) OR (Wuhan seafood market pneumonia virus) OR (COVID19 virus) OR (COVID-19 virus) OR (coronavirus disease 2019 virus) OR (SARS-CoV-2) OR (SARS2) OR (2019-nCoV) OR (2019 novel coronavirus)

The search strategy above will be used in Medline via Pubmed and will be adapted to the specifications of each database.

## Study selection

Two authors (FSAR and RRPS) will select the studies for inclusion in the review. When duplicated studies are found, only one of them will be considered for inclusion. If reports using the same participants and different outcome measurements or using different time points for the assessments are found, both reports will be included, but will be considered as parts of only one study. After removing duplicated studies and/or reports, the authors will read the study titles and abstracts. Studies that clearly do not fulfill the eligibility criteria will be excluded. The remaining studies will then be fully read and assessed for inclusion in the review. Disagreements between authors regarding the inclusion of studies will be solved by the third author (VFMT). We will present the reasons for exclusion of the studies. To optimize the process of screening and selection of studies, Rayyan application (8) will be used.

## **Data extraction**

Two authors (FSAR and RRPS) will independently extract data. Discrepancies or disagreements will be solved by a third author (VFMT). We will use a predefined form to extract data from included studies. The form will include information on: (I) Demographic and clinical characteristics of the patients or participants; (II) Time points used for the assessments; (III) Approach for handling missing data (data imputation/how data imputation was performed, use of intention-to-treat approach); (IV) Outcome measures; (V) Sources of funding; (VI) Possibility of conflict of interests;

## **Assessment of methodological quality in included studies and certainty of the body of evidence**

We will use the Risk of Bias tool as recommended by Cochrane Handbook for Systematic Reviews (9) to perform the critical appraisal of randomized clinical trials; for observational studies, we will use Newcastle-Ottawa Scale (10). The quality of evidence will be assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) (11). We will use the GRADE profiler software to summarize our findings on the quality of evidence (12). Assessment of risk of bias, and assessment of the certainty of evidence will be performed by two authors (FSAR and KMMM), and all the disagreements in the assessment of the risk of bias or quality of evidence will be solved through discussion or, if required, by consulting with a third author (VFMT).

## **Data Synthesis and Analysis**

When at least two studies are sufficiently homogeneous in terms of design, participants, intervention and outcome measurements, we will assess the possibility of pooling their results into meta-analysis. All possible analyses will be performed following the recommendations of Cochrane Handbook (9). If insufficient information or heterogeneous studies are found, the results of the studies will be summarized only in qualitative synthesis.

For evaluating prognosis, we will perform analyses according to the recommendations of Cochrane, and the Cochrane Prognosis Methods Group. When the response of interest is provided by continuous variable we will perform the analysis in terms of mean difference (MD) or Hedge's/Cohen's (SMD). In case of dichotomous response will pool a hazard

ratios (unadjusted (crude) or adjusted) or odds ratio with their standard errors for hospital admission, intensive care unit admission and/or respiratory support for adult inpatients with COVID-19 and mortality. All others parameters as standard deviation (for MD or SMD, for instance) and each number of events (RR or OR, for instance) will be pooled. In all cases we will use the generic inverse variance method with random-effects model. The package to be used is the “meta” (version 4.11-0).

### **Dealing with missing data**

For studies that do not provide a mean and associated standard deviation (SD), we will use information and results reported in the text or tables, doing the correct inference. When the parameters established before are not available, the estimate based on other parameters will be made ensuring the correct information.

We will contact the principal investigators of the included studies asking for additional data or to clarify issues about the studies. In the absence of a reply from the authors, we will expose the data in a descriptive manner avoiding imputation.

### **Assessment of heterogeneity**

We will employ the Cochran’s Q test to assess the presence of heterogeneity considering a threshold of P value  $< 0.1$  as an indicator of whether heterogeneity is present. In addition, we will assess statistical heterogeneity by examining the Higgins  $I^2$  statistic following these thresholds:  $< 25\%$ : no (none) heterogeneity;  $25\%$  to  $49\%$ : low heterogeneity;  $50\%$  to  $74\%$ : moderate heterogeneity;  $\geq 75\%$ : high heterogeneity.

## **DISCUSSION**

The strategies of social distancing, quarantine and isolation applied to reduce the COVID-19 transmissibility are necessary nowadays. In this context, the importance of using telehealth to provide assistance can be an interesting alternative. With the great amount of information and communication technologies being developed, it is important to know their outcomes and gains that can be followed for other health issues. Thus, this scoping review aims to summarize the current evidence in telehealth for COVID-19.

Potential limitations for this study include the possibility of finding biased studies which can make them unsuitable for providing precise estimates or reliable information.

## REFERENCE

1. Ren LL, Wang YM, Wu ZQ, et al. Identification of a novel coronavirus causing severe pneumonia in human: a descriptive study. *Chin Med J (Engl)*. 2020;10. doi:10.1097/CM9.0000000000000722.
2. Portnoy J, Waller M, Elliott T. Telemedicine in the Era of COVID-19 [published online ahead of print, 2020 Mar 24]. *J Allergy Clin Immunol Pract*. 2020;. doi:10.1016/j.jaip.2020.03.008
3. Flumignan CDQ, Rocha AP, Pinto ACPN, Milby KMMM, Batista MR, Atallah AN, Saconato, Ho. (2019). What do Cochrane systematic reviews say about telemedicine for healthcare?. *Sao Paulo Medical Journal*, 137(2), 184-192. Epub July 15, 2019. <https://doi.org/10.1590/1516-3180.0177240419>
4. World Health Organization. COVID-19 strategy update. WHO. Published online April 14, 2020. Available from: [https://www.who.int/docs/default-source/coronaviruse/covid-strategyupdate4april2020.pdf?sfvrsn=29da3ba0\\_19](https://www.who.int/docs/default-source/coronaviruse/covid-strategyupdate4april2020.pdf?sfvrsn=29da3ba0_19).
5. Gadzinski AJ, Andino JJ, Odisho AY, Watts KL, Gore JL, Ellimoottil C. Telemedicine and eConsults for Hospitalized Patients During COVID-19 [published online ahead of print, 2020 Apr 21]. *Urology*. 2020;S0090-4295(20)30419-2. doi:10.1016/j.urology.2020.04.061
6. Apple COVID-19. Available from: <https://apps.apple.com/us/app/id1504132184> Accessed in 2020 (Apr 30).
7. Tricco, A.C.; Lillie, E.; Zarin, W.; O'Brien, K.K.; Colquhoun, H.; Levac, D.; Moher, D.; Peters, M.; Horsley, T.; Weeks, L.; et al. PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Ann. Intern. Med.* 2018, 169, 467–473.
8. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan-a web and mobile app for systematic reviews. *Syst Rev*. 2016;5(1):210. DOI: 10.1186/s13643-016-0384-4.
9. Higgins J. *Cochrane Handbook for Systematic Reviews of Interventions* 2011.



10. Wells G, Shea B, O'Connell D, Peterson J, Welch V, Losos M et al. The Newcastle–Ottawa Scale (NOS) for assessing the quality of non-randomized studies in meta-analysis. [https://www.ohri.ca/programs/clinical\\_epidemiology/oxford.asp](https://www.ohri.ca/programs/clinical_epidemiology/oxford.asp) 2014.
11. Atkins D, Best D, Briss PA, Eccles M, Falck-Ytter Y, Flottorp S, et al. Grading quality of evidence and strength of recommendations. *Bmj*. 2004;328(7454):1490. DOI: 10.1136/bmj.328.7454.1490.
12. GDT G. Grade's software for summary of findings tables, health technology assessment and guidelines 2015 [Available from: <https://gradepro.org/>].

## Appendix 1 . Strategies

### COCHRANE LIBRARY

#1 (COVID 19) OR (COVID-19) OR (2019-nCoV) OR (nCoV) OR (Covid19) OR (SARS-CoV) OR (SARSCov2 or ncov\*) OR (SARSCov2) OR (2019 coronavirus\*) OR (2019 corona virus\*) OR (Coronavirus (COVID-19)) OR (2019 novel coronavirus disease) OR (COVID-19 pandemic) OR (COVID-19 virus infection) OR (coronavirus disease-19) OR (2019 novel coronavirus infection) OR (2019-nCoV infection) OR (coronavirus disease 2019) OR (2019-nCoV disease) OR (COVID-19 virus disease) OR "severe acute respiratory syndrome coronavirus 2" [Supplementary Concept] OR (Wuhan coronavirus) OR (Wuhan seafood market pneumonia virus) OR (COVID19 virus) OR (COVID-19 virus) OR (coronavirus disease 2019 virus) OR (SARS-CoV-2) OR (SARS2) OR (2019-nCoV) OR (2019 novel coronavirus)

### EMBASE

#1 'covid 19'/exp OR (COVID 19) OR (COVID-19) OR (2019-nCoV) OR (nCoV) OR (Covid19) OR (SARS-CoV) OR (SARSCov2 or ncov\*) OR (SARSCov2) OR (2019 coronavirus\*) OR (2019 corona virus\*) OR (Coronavirus (COVID-19)) OR (2019 novel coronavirus disease) OR (COVID-19 pandemic) OR (COVID-19 virus infection) OR (coronavirus disease-19) OR (2019 novel coronavirus infection) OR (2019-nCoV infection) OR (coronavirus disease 2019) OR (2019-nCoV disease) OR (COVID-19 virus disease) OR (severe acute respiratory syndrome coronavirus 2) OR (Wuhan coronavirus) OR (Wuhan seafood market pneumonia virus) OR (COVID19 virus) OR (COVID-19 virus) OR (coronavirus disease 2019 virus) OR (SARS-CoV-2) OR (SARS2) OR (2019-nCoV) OR (2019 novel coronavirus)

**WEB OF SCIENCE**

#1 (COVID 19) OR (COVID-19) OR (2019-nCoV) OR (nCoV) OR (Covid19) OR (SARS-CoV) OR (SARSCov2 or ncov\*) OR (SARSCov2) OR (2019 coronavirus\*) OR (2019 corona virus\*) OR (Coronavirus (COVID-19)) OR (2019 novel coronavirus disease) OR (COVID-19 pandemic) OR (COVID-19 virus infection) OR (coronavirus disease-19) OR (2019 novel coronavirus infection) OR (2019-nCoV infection) OR (coronavirus disease 2019) OR (2019-nCoV disease) OR (COVID-19 virus disease) OR (severe acute respiratory syndrome coronavirus 2) OR (Wuhan coronavirus) OR (Wuhan seafood market pneumonia virus) OR (COVID19 virus) OR (COVID-19 virus) OR (coronavirus disease 2019 virus) OR (SARS-CoV-2) OR (SARS2) OR (2019-nCoV) OR (2019 novel coronavirus)

**SCOPUS**

#1 (COVID 19) OR (COVID-19) OR (2019-nCoV) OR (nCoV) OR (Covid19) OR (SARS-CoV) OR (SARSCov2 or ncov\*) OR (SARSCov2) OR (2019 coronavirus\*) OR (2019 corona virus\*) OR (Coronavirus (COVID-19)) OR (2019 novel coronavirus disease) OR (COVID-19 pandemic) OR (COVID-19 virus infection) OR (coronavirus disease-19) OR (2019 novel coronavirus infection) OR (2019-nCoV infection) OR (coronavirus disease 2019) OR (2019-nCoV disease) OR (COVID-19 virus disease) OR (severe acute respiratory syndrome coronavirus 2) OR (Wuhan coronavirus) OR (Wuhan seafood market pneumonia virus) OR (COVID19 virus) OR (COVID-19 virus) OR (coronavirus disease 2019 virus) OR (SARS-CoV-2) OR (SARS2) OR (2019-nCoV) OR (2019 novel coronavirus)

**PORTAL REGIONAL BVS**

MH:"Infecções por Coronavirus" OR (Infecções por Coronavirus) OR (Infecciones por Coronavirus) OR (Coronavirus Infections) OR (COVID-19) OR (COVID 19) OR (Doença pelo Novo Coronavírus (2019-nCoV)) OR (Doença por Coronavírus 2019-nCoV) OR (Doença por Novo Coronavírus (2019-nCoV)) OR (Epidemia de Pneumonia por Coronavirus de Wuhan) OR (Epidemia de Pneumonia por Coronavírus de Wuhan) OR (Epidemia de Pneumonia por Coronavírus de Wuhan de 2019-2020) OR (Epidemia de Pneumonia por Coronavírus em Wuhan) OR (Epidemia de Pneumonia por Coronavírus em Wuhan de 2019-2020) OR (Epidemia de Pneumonia por Novo Coronavírus de 2019-2020) OR (Epidemia pelo Coronavírus de Wuhan) OR (Epidemia pelo Coronavírus em Wuhan) OR (Epidemia pelo Novo Coronavírus (2019-nCoV)) OR (Epidemia pelo Novo Coronavírus 2019) OR (Epidemia por 2019-nCoV) OR (Epidemia por Coronavírus de Wuhan) OR (Epidemia por Coronavírus em Wuhan) OR (Epidemia por Novo Coronavírus (2019-nCoV)) OR (Epidemia por Novo Coronavírus 2019) OR (Febre de Pneumonia por Coronavírus de Wuhan) OR (Infecção pelo Coronavírus

2019-nCoV) OR (Infecção pelo Coronavírus de Wuhan) OR (Infecção por Coronavirus 2019-nCoV) OR (Infecção por Coronavírus 2019-nCoV) OR (Infecção por Coronavírus de Wuhan) OR (Infecções por Coronavírus) OR (Pneumonia do Mercado de Frutos do Mar de Wuhan) OR (Pneumonia no Mercado de Frutos do Mar de Wuhan) OR (Pneumonia por Coronavírus de Wuhan) OR (Pneumonia por Novo Coronavírus de 2019-2020) OR (Surto de Coronavírus de Wuhan) OR (Surto de Pneumonia da China 2019-2020) OR (Surto de Pneumonia na China 2019-2020) OR (Surto pelo Coronavírus 2019-nCoV) OR (Surto pelo Coronavírus de Wuhan) OR (Surto pelo Coronavírus de Wuhan de 2019-2020) OR (Surto pelo Novo Coronavírus (2019-nCoV)) OR (Surto pelo Novo Coronavírus 2019) OR (Surto por 2019-nCoV) OR (Surto por Coronavírus 2019-nCoV) OR (Surto por Coronavírus de Wuhan) OR (Surto por Coronavírus de Wuhan de 2019-2020) OR (Surto por Novo Coronavírus (2019-nCoV)) OR (Surto por Novo Coronavírus 2019) OR (Síndrome Respiratória do Oriente Médio) OR (Síndrome Respiratória do Oriente Médio (MERS)) OR (Síndrome Respiratória do Oriente Médio (MERS-CoV)) OR (Síndrome Respiratória do Oriente Médio por Coronavírus) OR MH:C01.925.782.600.550.200\$