

# INPLASY

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## Health outcome improvement interventions that provided pediatric telehealth services during a period within the COVID-19 pandemic: A systematic review protocol

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## ADMINISTRATIVE INFORMATION

**Support** - Frances Willson Thompson Fellowship.

**Review Stage at time of this submission** - Data analysis.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202380032

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 08 August 2023 and was last updated on 21 November 2023.

## INTRODUCTION

**Review question / Objective** The objective is to systematically review interventions that have comparison groups with at least one group receiving telehealth services among pediatric populations with different health conditions during a time frame within the COVID-19 pandemic.

**Rationale** Telehealth services may decrease exposure to viruses and improve patient access to healthcare appointments. Much research focused on the convenience benefits of telehealth for patients such as saved time and decreased travel. Limited research was conducted on how the use of telehealth influenced the health of children during the COVID-19 pandemic. A published systematic review focused on health outcomes among pediatric populations with varying health conditions prior to the pandemic (Shah and Badawy, 2021). It found that telehealth was similar or superior to control services in improving health outcomes. The current systematic review focused

on health outcome improvement interventions among pediatric populations with various health conditions utilizing telehealth services compared to those in control groups during a period within the COVID-19 pandemic (i.e., published up to December 5th, 2022).

**Condition being studied** Any health conditions were included.

## METHODS

**Search strategy** PubMed

("telehealth s"[All Fields] OR "telemedicine"[MeSH Terms] OR "telemedicine"[All Fields] OR "telehealth"[All Fields] OR ("telemedicine"[MeSH Terms] OR "telemedicine"[All Fields] OR "telemedicine s"[All Fields]) OR "telemonitor"[All Fields] OR "telepsych"[All Fields]) AND ("children"[All Fields] OR "adolesc"[All Fields] OR "youth"[All Fields] OR "child"[All Fields] OR "teen"[All Fields] OR "kids"[All Fields] OR "paediatric patient"[All Fields] OR "pediatric patient"[All Fields] OR ("paediatrics"[All Fields] OR

"pediatrics"[MeSH Terms] OR "pediatrics"[All Fields] OR "paediatric"[All Fields] OR "pediatric"[All Fields]) OR ("paediatrics"[All Fields] OR "pediatrics"[MeSH Terms] OR "pediatrics"[All Fields] OR "paediatric"[All Fields] OR "pediatric"[All Fields]))

AND

("covid 19"[All Fields] OR "covid 19"[MeSH Terms] OR "covid 19 vaccines"[All Fields] OR "covid 19 vaccines"[MeSH Terms] OR "covid 19 serotherapy"[All Fields] OR "covid 19 serotherapy"[Supplementary Concept] OR "covid 19 nucleic acid testing"[All Fields] OR "covid 19 nucleic acid testing"[MeSH Terms] OR "covid 19 serological testing"[All Fields] OR "covid 19 serological testing"[MeSH Terms] OR "covid 19 testing"[All Fields] OR "covid 19 testing"[MeSH Terms] OR "sars cov 2"[All Fields] OR "sars cov 2"[MeSH Terms] OR "severe acute respiratory syndrome coronavirus 2"[All Fields] OR "ncov"[All Fields] OR "2019 ncov"[All Fields] OR ("coronavirus"[MeSH Terms] OR "coronavirus"[All Fields] OR "cov"[All Fields]) AND 2019/11/01:3000/12/31[Date - Publication]) OR ("coronavirus"[MeSH Terms] OR "coronavirus"[All Fields] OR "coronaviruses"[All Fields]) OR ("sars cov 2"[MeSH Terms] OR "sars cov 2"[All Fields] OR "2019 ncov"[All Fields] OR ("sars cov 2"[MeSH Terms] OR "sars cov 2"[All Fields] OR "sars cov 2"[All Fields]) OR "cov-19"[All Fields] OR ("pandemic s"[All Fields] OR "pandemically"[All Fields] OR "pandemicity"[All Fields] OR "pandemics"[MeSH Terms] OR "pandemics"[All Fields] OR "pandemic"[All Fields]) OR "2019 novel coronavirus"[All Fields] OR "coronavirus disease"[All Fields])

AND

("intervention s"[All Fields] OR "interventions"[All Fields] OR "interventive"[All Fields] OR "methods"[MeSH Terms] OR "methods"[All Fields] OR "intervention"[All Fields] OR "interventional"[All Fields] OR "randomized-controlled trial"[All Fields] OR ("random allocation"[MeSH Terms] OR "random"[All Fields] AND "allocation"[All Fields]) OR "random allocation"[All Fields] OR "random"[All Fields] OR "randomization"[All Fields] OR "randomized"[All Fields] OR "randomisation"[All Fields] OR "randomisations"[All Fields] OR "randomise"[All Fields] OR "randomised"[All Fields] OR "randomising"[All Fields] OR "randomizations"[All Fields] OR "randomize"[All Fields] OR "randomizes"[All Fields] OR "randomizing"[All Fields] OR "randomness"[All Fields] OR "randoms"[All Fields]) OR "quasi-experimental"[All Fields] OR "qualitative intervention"[All Fields] OR "mixed-methods intervention"[All Fields]))

AND

((clinicalstudy[Filter] OR clinicaltrial[Filter] OR comparative study[Filter] OR controlledclinicaltrial[Filter] OR evaluationstudy[Filter] OR multicenterstudy[Filter] OR observationalstudy[Filter] OR pragmaticclinicaltrial[Filter] OR randomizedcontrolledtrial[Filter]) AND (english[Filter]) AND (allchild[Filter] OR allinfant[Filter] OR newborn[Filter] OR infant[Filter] OR preschoolchild[Filter] OR child[Filter] OR adolescent[Filter]))

AND THE FOLLOWING FILTERS APPLIED

Clinical Study, Clinical Trial, Comparative Study, Controlled Clinical Trial, Evaluation Study, Multicenter Study, Observational Study, Pragmatic Clinical Trial, Randomized Controlled Trial, English, Child: birth-18 years, Infant: birth-23 months, Newborn: birth-1 month, Infant: 1-23 months, Preschool Child: 2-5 years, Child: 6-12 years, Adolescent: 13-18 years.

EMBASE

('telehealth'/exp OR telehealth OR 'telemedicine'/exp OR telemedicine OR telemonitor\* OR telepsych\*)

AND

(children\* OR adolesc\* OR youth\* OR child\* OR teen\* OR kids\* OR 'paediatric patient\*' OR 'pediatric patient\*' OR 'paediatric'/exp OR paediatric OR 'pediatric'/exp OR pediatric)

AND

('covid 19'/exp OR 'covid 19' OR 'coronavirus'/exp OR coronavirus OR '2019 ncov'/exp OR '2019 ncov' OR 'sars cov 2'/exp OR 'sars cov 2' OR 'cov 19' OR 'pandemic'/exp OR pandemic OR '2019 novel coronavirus'/exp OR '2019 novel coronavirus' OR 'coronavirus disease')

AND

('intervention'/exp OR intervention OR 'randomized-controlled trial'/exp OR 'randomized-controlled trial' OR randomized OR 'quasi experimental' OR 'qualitative intervention' OR 'mixed-methods intervention')

AND THE FOLLOWING FILTERS

[english]/lim AND ([article]/lim OR [article in press]/lim) AND ([newborn]/lim OR [infant]/lim OR [child]/lim OR [preschool]/lim OR [school]/lim OR [adolescent]/lim)

CINAHL in EBSCO

( (Telehealth or telemedicine or telemonitor\* or telepsych\*))

AND

( (children\* or adolesc\* or youth\* or child\* or teen\* or kids\* or "paediatric patient\*" or "pediatric patient\*" or paediatric or pediatric))

AND

( (covid-19 or coronavirus or 2019-ncov or sars-cov-2 or cov-19 or pandemic or "2019 novel coronavirus" or "coronavirus disease"))

AND  
 ( (Intervention or “randomized-controlled trial” or randomized or quasi-experimental or “qualitative intervention” or “mixed-methods intervention”)  
 AND THE FOLLOWING FILTERS  
 English Language; Peer Reviewed; Age Groups: Infant, Newborn: birth-1 month, Infant: 1-23 months, Child, Preschool: 2-5 years, Child: 6-12 years, Adolescent: 13-18 years, All Infant, All Child PsychINFO in EBSCO  
 ( (Telehealth or telemedicine or telemonitor\* or telepsych\*))  
 AND  
 ( (children\* or adolesc\* or youth\* or child\* or teen\* or kids\* or “paediatric patient\*\*” or “pediatric patient\*\*” or paediatric or pediatric) )  
 AND  
 ( (covid-19 or coronavirus or 2019-ncov or sars-cov-2 or cov-19 or pandemic or “2019 novel coronavirus” or “coronavirus disease”)  
 AND  
 ( (Intervention or “randomized-controlled trial” or randomized or quasi-experimental or “qualitative intervention” or “mixed-methods intervention”)  
 AND THE FOLLOWING FILTERS  
 Peer Reviewed; Language: English; Age Groups: Childhood (birth-12 yrs), Neonatal (birth-1 mo), Infancy (2-23 mo), Preschool Age (2-5 yrs), School Age (6-12 yrs), Adolescence (13-17 yrs).

**Participant or population** Pediatric patients consisting of infants, children and adolescents (birth to age 17) were included. If studies combined young adults with adolescents, studies were still eligible for inclusion.

**Intervention** The intervention involved receipt of telehealth services (i.e. remote care, telemedicine, telemonitoring).

**Comparator** There should be at least 1 comparison group such as a group receiving in-person services, other services (such as recorded videos with information), or a wait-listed group not receiving telehealth services.

**Study designs to be included** Randomized-controlled trials as well as quasi-experimental studies with at least a total of 2 comparison groups were included. Both qualitative and quantitative studies with comparison groups were eligible.

**Eligibility criteria** The inclusion criteria were peer-reviewed studies with full-text in English assessing interventions with at least one group receiving telehealth services and at least one control group during a period within the COVID-19 pandemic.

The (PI(E)COS) structure of this systematic review is:

**Outcome:** Any mental or physical health outcome. Any chronic and non-chronic health outcomes were included. No key words for specific outcomes were included in the search strategy.

**Participants:** Pediatric patients specifically infants, children and adolescents (birth-age 17) and pediatric patients whose results on health outcome changes were combined with those of young adults (birth-age 30). Since children with some health conditions are assisted by pediatric healthcare providers during their transition from childhood to adulthood, studies that combined pediatric populations with young adults were eligible.

**Intervention/Exposure:** Telehealth with no restrictions on the technology and modality of telehealth.

**Comparison Group:** At least one comparison group receiving services different than those in the telehealth group or not receiving any services such as in-person visits, both in-person and telehealth services, different telehealth services, or wait-list groups not receiving telehealth or any services.

**Time Frame:** A period within the COVID-19 pandemic. Studies were restricted to those conducted during a period within the COVID-19 pandemic (i.e., published until December 5, 2022).

**Information sources** The PubMed, Embase, PsycInfo, and CINAHL databases were searched.

**Main outcome(s)** Any physical and mental health outcomes were included.

#### Quality assessment / Risk of bias analysis

Revised Joanna Briggs Institute (JBI) Critical Appraisal Tools [20] helped assess the quality of evidence across studies. The following questions were answered independently by reviewers:

Were the criteria for inclusion in the sample clearly defined?

Were the socio-demographic characteristics of participants described in detail?

Was the time period (such as months and years) for telehealth services clearly defined?

Were measures valid and reliable?

Were appropriate statistical analyses made?

Authors separately assigned a score for each question and resolved disagreements through consensus with 0 indicating No or Unclear, 0.5 indicating Partially, and 1 indicating Yes for answers to the questions above. Higher scores indicated a lower risk of bias, and lower scores indicated an increased risk of bias. In addition, any differences in socio-demographic characteristics in the comparison groups as well as the information

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on the validity and reliability of outcome measures were also summarized in a narrative form in a table for each study.

**Strategy of data synthesis** Articles were uploaded into EndNote (Clarivate) for deduplication. Two authors reviewed all titles and abstracts. Full-text articles were subsequently reviewed once a decision was made based on the titles and abstracts. During both the title/abstract and full text review stage, an article was excluded if the title/abstract or full text signified that the study focused on a non-pediatric population, was a literature review, was not an intervention, was an intervention without comparison groups, or was conducted outside of the time frame of the COVID-19 pandemic. Disagreements on inclusion between authors were discussed after the full-text review through consensus. Study characteristics and essential study results (specifically country, sample size by comparison group, mean age by comparison group, health conditions, type of telehealth, i.e., asynchronous/synchronous, intervention strategies, outcomes, and findings) were extracted in tables. Important study findings that were extracted included results that focused on whether telehealth was associated with similar, better, or worse health outcomes compared to the comparison group(s).

**Subgroup analysis** No subgroup analysis was performed.

**Sensitivity analysis** No sensitivity analysis was performed.

**Language restriction** The language was English.

**Country(ies) involved** United States (College of Health Sciences, University of Michigan - Flint and Institute for Healthcare Policy and Innovation, University of Michigan).

**Keywords** telehealth, telemedicine, remote care, remote monitoring, health, infants, children, adolescents, pediatric.

**Other relevant information** The base PubMed string was translated to generate identical/similar search strings for the CINAHL and Embase databases in the Polyglot Search in the Systematic Review Accelerator by the Institute for Evidence-Based Health Care (<https://sr-accelerator.com/#/polyglot>). The search string for the CINAHL database was translated so that it was identical to/as similar as possible as the PsychInfo database one through the Polyglot Search in the Systematic Review Accelerator.

“Qualitative intervention” was included in our search so that mixed-method or qualitative studies using that key term may be included if they met our criteria. Both prospective and retrospective analyses were included. We used PubMed Medical Subject Headings (MeSH) terms and Embase explosion (indicated by /exp) terms in our search. MeSH and explosion terms included their own synonyms during the search. For instance, “telemedicine” was entered as a MeSH term in the PubMed search, and was related to synonyms including “telehealth,” “tele-referral,” “virtual medicine,” “tele-intensive care,” “tele-ICU,” “mobile health,” “mHealth,” and “eHealth.”

#### **Contributions of each author**

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