

# INPLASY

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## Interventions on the effectiveness of telehealth in improving pediatric health during the COVID-19 pandemic: a systematic literature review

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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 08 August 2023.

## INTRODUCTION

**Review question / Objective** What was the effectiveness of telehealth in improving health outcomes only in interventions with at least one telehealth group and one control group?

**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.

Please find enclosed our manuscript, "Interventions on the effectiveness of telehealth compared to non-telehealth services in improving pediatric health during the COVID-19 pandemic: a systematic literature review" which we would like to submit in Health Sciences Review.

The purpose of our review was to understand how the use of telehealth influenced the health of

children during the COVID-19 pandemic only in interventions that compared at least one group of participants receiving remote care and a control group of participants receiving non-telehealth or other health care services. Following PRISMA guidelines for this registered review, we identified 10 articles that matched our search criteria, with all studies being randomized controlled trials or non-randomized, 3-group designs. After analysis, we found that the use of telehealth compared to wait-listed or in-person health care services had significant positive impacts on the overall health of children with disabilities and pre-existing conditions in 6 out of the 10 studies. Children demonstrated notable improvements across mental, physical, and developmental domains through the use of different valid and reliable measures. Results from this study included infants to young adults across 5 countries and of different socio-economic status.

**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 comparativestudy[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 the effectiveness of pediatric telehealth on health in interventions with comparison groups during the COVID-19 pandemic.

**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 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 (GK and TC) reviewed all titles and abstracts. Full-text articles were subsequently reviewed once a decision was made based on the titles and abstracts. Disagreements between authors were discussed after the full-text review through consensus. Study characteristics and essential study results (specifically country, sample size by comparison group, age by comparison group, health conditions, intervention

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strategies, assessment of outcomes, and findings) were then extracted in tables.

**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.

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

**Contributions of each author**

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Author 3 - Bushra Kawser.

Author 4 - Saman Amin.