Revista Brasileira de Enfermagem
REBEn

SUPPLEMENTARY EDITION 1
CORONAVIRUS/COVID-19

REVIEW

Epidemiological profile of children and adolescents with COVID-19: a scoping review

Perfil epidemiológico de crianças e adolescentes com COVID-19: uma revisão de escopo

Perfil epidemiológico de niños y adolescentes con COVID-19: revisión del alcance

Fabiane Blanco Silva Bernardino[I]
ORCID: 0000-0003-0339-9451

Lidiane Cristina da Silva Alencastro[I]
ORCID: 0000-0003-3005-415X

Ronaldo Antonio da Silva[II]
ORCID: 0000-0002-1962-3182

Antonia Dinágila do Nascimento Ribeiro[I]
ORCID: 0000-0001-7852-9199

Geovane Roberto de Campos Castilho[I]
ORCID: 0000-0002-6300-1479

Maria Aparecida Munhoz Gaíva[I]
ORCID: 0000-0002-8666-9738

[I] *Universidade Federal de Mato Grosso. Cuiabá, Mato Grosso, Brazil.*
[II] *Universidade do Estado de Mato Grosso. Diamantino, Mato Grosso, Brazil.*

Como citar este artigo:
Bernardino FBS, Alencastro LCS, Silva RA, Ribeiro ADN, Castilho GRC, Gaíva MAM. Epidemiological profile of children and adolescents with COVID-19: a scoping review. Rev Bras Enferm. 2021;74(Suppl 1):e20200624. doi: http://dx.doi.org/10.1590/0034-7167-2020-0624

Corresponding author:
Fabiane Blanco Silva Bernardino
E-mail: fabianeblanco25@gmail.com

Submission: 06-12-2020 **Approval:** 09-20-2020

ABSTRACT

Objective: to map the epidemiological profile of children and adolescents with COVID-19 in the world literature. **Methods:** a scoping review systematized by the Joanna Briggs Institute protocol in the PubMed/MEDLINE, CINAHL, Web of Science, Scopus, Science direct and Google Scholar databases. Articles with children and/or adolescents with laboratory diagnosis of COVID-19 were used. **Results:** thirty-two articles were included in the review. Most children and adolescents were male, with contamination by family transmission. The most frequent clinical manifestations were fever, cough and diarrhea. Ten studies cited pre-existing condition/disease, and hospital length ranged from one to twenty days. Three deaths were reported and no study presented race/color, education and socioeconomic conditions. **Conclusion:** it was possible to screen the epidemiological profile with information about age group, sex, probable contamination of the disease, clinical manifestations, presence of pre-existing disease/condition, hospitalization and deaths among children and adolescents with COVID-19.

Descriptors: COVID-19; Health Profile; Child; Adolescent; Epidemiology.

RESUMO

Objetivo: mapear o perfil epidemiológico de crianças e adolescentes com COVID-19 na literatura mundial. **Métodos:** *scoping review* sistematizada pelo protocolo *Joanna Briggs Institute* nas bases de dados PubMed/MEDLINE, CINAHL, *Web of Science*, Scopus, *Science direct* e Google Acadêmico. Foram utilizados artigos com crianças e/ou adolescentes com diagnóstico laboratorial da COVID-19. **Resultados:** trinta e dois artigos foram incluídos na revisão. A maioria das crianças e adolescentes era do sexo masculino, com contaminação pela transmissão familiar. As manifestações clínicas mais frequentes foram febre, tosse e diarreia. Dez estudos citaram condição/doença pré-existentes, e o tempo de internação variou de um a vinte dias. Três óbitos foram referidos e nenhum estudo apresentou a raça/cor, escolaridade e condições socioeconômicas. **Conclusão:** foi possível traçar o perfil epidemiológico com informações sobre faixa etária, sexo, provável contaminação da doença, manifestações clínicas, presença de doença/condição pré-existente, internação e óbitos entre crianças e adolescentes com COVID-19.

Descritores: COVID-19; Perfil de Saúde; Criança; Adolescente; Epidemiologia.

RESUMEN

Objetivo: mapear el perfil epidemiológico de niños y adolescentes con COVID-19 en la literatura mundial. **Métodos:** revisión de alcance sistematizada por el protocolo del Instituto Joanna Briggs en las bases de datos PubMed/MEDLINE, CINAHL, Web of Science, Scopus, Science direct y Google Académico. Se utilizaron artículos con niños y/o adolescentes con diagnóstico de laboratorio de COVID-19. **Resultados:** se incluyeron treinta y dos artículos en la revisión. La mayoría de los niños y adolescentes eran varones, contaminados por transmisión familiar. Las manifestaciones clínicas más frecuentes fueron fiebre, tos y diarrea. Diez estudios citaron afecciones/enfermedades preexistentes y la duración de la estancia hospitalaria varió de uno a veinte días. Se informaron tres muertes y ningún estudio presentó raza/color, educación y condiciones socioeconómicas. **Conclusión:** fue posible trazar el perfil epidemiológico con información sobre grupo de edad, sexo, probable contaminación de la enfermedad, manifestaciones clínicas, presencia de enfermedad/condición preexistente, hospitalización y muertes en niños y adolescentes con COVID-19.

Descriptores: COVID-19; Perfil de Salud; Niño; Adolescente; Epidemiología.

INTRODUCTION

In December 2019, the World Health Organization (WHO) was triggered due to a significant and abrupt increase in cases of pneumonia in the city of Wuhan, China[1], whose cause referred to a new coronavirus strain, named, in January 2020, as 2019-nCoV, which spread rapidly around the world, generating high rates of morbidity and mortality in the population. Altogether, seven coronaviruses have been recognized in humans: HCoV-229E, HCoV-OC43, HCoV-NL63, HCoV-HKU1, SARS-COV (which causes severe acute respiratory syndrome), MERS-COV (which causes Middle East Respiratory Syndrome) and the most current - SARS-CoV-2, which causes COVID-19, a new coronavirus disease[2-3].

SARS-CoV-2 is considered a highly contagious virus, and infected people can remain asymptomatic or with clinical symptoms, ranging from mild or moderate to most severe, with a variable incubation period of up to fourteen days, being the more frequent symptoms appear between the fourth and eighth day[4]. In a study conducted between January and February 2020, the following clinical symptoms of COVID-19 were identified in decreasing order of occurrence: fever (82%), cough with or without sputum (61%), muscle pain and/or fatigue (36%), dyspnea (26%), headache (12%), sore throat (10%) and gastrointestinal symptoms (9%)[3].

According to the Pan American Health Organization (PAHO), 14% of people affected by COVID-19 appear to develop the most severe form and 5% evolve to the most critical situation[2]. Although the mortality rate may fluctuate according to different countries and territories, in general, it is associated with factors such as age and presence of comorbidities[1-3]. Research shows that the infection affected the population aged between 3 months and 99 years. Of this group, the most severe cases correlated with older age and presence of comorbidities, such as hypertension, diabetes, smoking, chronic and cardiovascular liver diseases[1-3].

In March 2020, COVID-19 was configured as a pandemic, and although it has a mortality rate of 2 to 4%, it has a greater infection capacity than other viral infections[4]. According to WHO and PAHO, contagion occurs mainly through the respiratory droplets of the infected person, which can be from person to person (through sneezing, coughing or speaking) or through contact with contaminated objects, when respiratory droplets from contaminated people remain on the surfaces[2]. According to the WHO Epidemiological Bulletin made available on May 19, 2020, so far, there are 4,731,458 cases and 316,169 confirmed deaths worldwide, of which 241,080 cases and 16,118 deaths occurred in Brazil[5].

The spread of the new human coronavirus disease is an international public health emergency. Since its inception, the world scientific community has endeavored to develop studies, either through literature reviews or original research, in order to add information and contributory results for COVID-19 control in different territories and population groups[4,6].

However, the available information on the severity and comorbidities of children and adolescents with COVID-19 is more inconsistent when compared with data from adults with the disease[7-8], which makes it difficult to detect risk factors for complications and mortality that age group of the population[7]. In such a context, knowing the characteristics of children and adolescents infected by the SARS-CoV-2 virus becomes essential to better understand how the disease affects this age group and what are the converging factors in their infection. International researchers point out that, among the main challenges faced by nursing professionals during the pandemic, are the support to know the gaps in knowledge and research to improve the science on COVID-19 prevention and management[9]. In this context, the present study may also contribute to the understanding of the natural history of the disease in children and adolescents, as well as support actions and strategies for screening, early diagnosis, treatment, rehabilitation and monitoring in this population[7].

OBJECTIVE

To map the epidemiological profile of children and adolescents with COVID-19 in the world literature.

METHODS

The on-screen study is configured as a scoping review based on the protocol proposed by the Joanna Briggs Institute[10], organized by the Preferred Reporting Items for Systematic Review and Meta-Analyzes extension for Scoping Reviews (PRISMA-ScR), whose objective is to map concepts fundamental knowledge of a given area of knowledge, through a comprehensive coverage of the literature, to identify existing research gaps. The research question was constructed using PCC strategy, which recommends the mnemonic as fundamental elements: P - Population, C - Concept and C - Context. The elements were defined: P (children and adolescents with COVID-19); C (epidemiological profile) and C (world context). From this, the following research question was elaborated: what is the epidemiological profile of children and adolescents with COVID-19 in the global context?

After formulating the research question, the stage of identifying relevant studies was carried out in the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, Scopus, Science direct databases, accessed through the CAPES journals portal through of Café and Google Scholar access. The search strategy included three stages: in the first, the search was limited to the PubMed/MEDLINE database, followed by an analysis of the most used words in the titles and abstracts of the articles. In the second stage, searches were carried out in all databases using the keywords identified in the previous stage. In the third stage, the reference list of the articles collected was consulted in order to identify additional studies that had not been mapped in the previous stages. Throughout the system, the three stages were undertaken independently by two reviewers. It should be noted that any disagreements between the reviewers were resolved through a critical discussion with a third reviewer.

The keywords and terms in English were synthesized, respecting PCC strategy, and are described in Chart 1.

To survey the studies, scientific articles were selected, available in full, in Portuguese, English and Spanish, published from December 2019 until the end of April 2020, when the search was carried out. Additionally, studies whose participants were children or adolescents aged up to 19 years and the diagnosis of COVID-19 confirmed by laboratory examination were used as inclusion criteria. Publications that did not answer the research question and duplicates were excluded.

Chart 1 - Search strategy and article numbers identified in different databases

Database	Search strategy	Total
PubMed/ MEDLINE	"Infant, newborn" OR "Infant" OR "Children, preschool" OR "Child" OR "Adolescent" AND "Health profile" AND "Risk factors" AND "Mortality" AND "morbidity" AND "COVID-19 virus" OR "SARS-CoV-2" OR "2019-nCoV" OR "coronavirus disease 2019"	868
CINAHL	"Infant, newborn" AND "Infant" AND "Children, preschool" AND "Child" AND "Adolescent" AND "Health profile" AND "Risk factors" AND "Mortality" AND "morbidity" AND "COVID-19 virus" OR "SARS-CoV-2" OR "2019-nCoV" OR "coronavirus disease 2019"	43
Web of Science	"Infant, newborn" AND "Infant" AND "Children, preschool" AND "Child" AND "Adolescent" AND "Health profile" AND "Risk factors" AND "Mortality" AND "morbidity" AND "COVID-19 virus" OR "SARS-CoV-2" OR "2019-nCoV" OR "coronavirus disease 2019"	481
Scopus	"Infant, newborn" OR "Children, preschool" AND "Adolescent" AND "Mortality" OR "morbidity" AND "COVID-19 virus" OR "SARS-CoV-2" OR "2019-nCoV" OR "coronavirus disease 2019"	4
Science direct	"Infant, newborn" OR "Child" AND "Adolescent" AND "Mortality" AND "morbidity" AND "COVID-19 virus" OR "SARS-CoV-2" OR "2019-nCoV" OR "coronavirus disease 2019"	446
Google Scholar	"Child" OR "Adolescent" AND "Mortality" AND "morbidity" AND "COVID-19 virus"	59

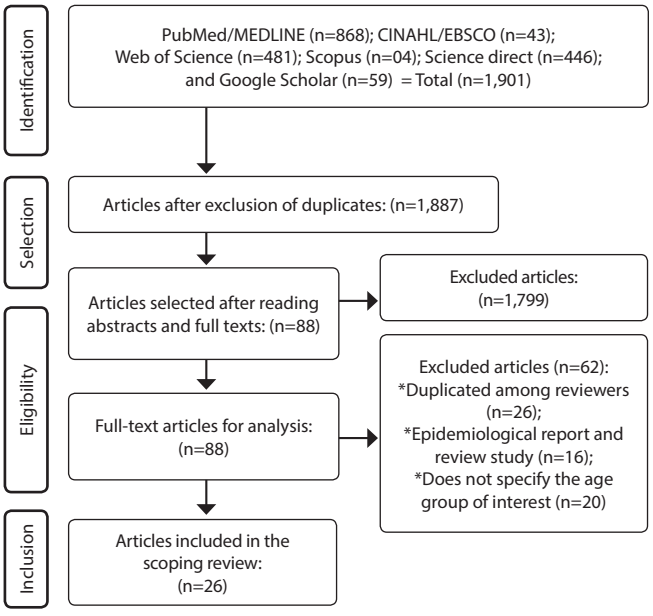

Figure 1 - Search and selection process flowchart for the review articles, Brazil, 2020

Search description and article selection was based on the Preferred Reporting Items for Systematic Review and Meta-Analyzes (PRISMA)[10]. Thus, 26 articles were mapped (figure 1). After analyzing their references, six more studies were added, totaling 32 scientific articles included in the final analysis of the scoping review.

The data extracted from the documents included specific details about the authors, year of publication, country, type of study, number of research participants, laboratory diagnosis and epidemiological profile, which was characterized by the age group of participants, probable contamination of the disease, manifestations clinics, presence of pre-existing disease or condition, hospitalization and mortality. Finally, the results were grouped and synthesized, with the main objective of presenting an overview of all the material.

Furthermore, as this is a systematic scope review, according to the methodology adopted, it is not necessary to assess the methodological quality of the included studies.

As for the ethical aspect, the reliability and fidelity of the information contained in the selected publications were guaranteed. These aspects were ensured through adequate referencing and rigor in data treatment and presentation.

RESULTS

All articles were published in the year 2020, and most of them in China (n=26). As for the type of study, most were cross-sectional (n=14) or not specified (n=9) and the number of participants ranged from 1 to 2,135 child (s) and/or adolescent (s) (Chart 2).

In the studies analyzed, the laboratory diagnosis of COVID-19 in children and adolescents was obtained by serological test[11] and by RT-PCR[8,12-41].

With regard to information on the epidemiological profile of children and adolescents with COVID-19, it is highlighted that the studies did not expose sociodemographic particularities (race/color, education and/or socioeconomic conditions). The age group of those involved ranged from newborn and one-year-old children to adolescents aged 18. There was a greater participation in the studies analyzed of men (n=1399). With regards to the form of contamination of children and adolescents, studies have shown the predominance of family transmission (n=15), followed by community transmission (n=12). When mentioning presence of a pre-existing disease or condition, most did not specify whether participants had any previous morbidity (n=15); in 10 studies, children and adolescents did not have pre-existing illnesses or poor health conditions[12,16-17,19-22,24,32,36]; in the other studies, heart failure[11], prematurity[13], previous infection by *Streptococcus*[23], hydronephrosis and leukemia[18] and liver diseases or changes[33,40] were highlighted. As for the need for hospitalization, most studies (n=24) reported that children and/or adolescents were hospitalized for a period of 1 to 20 days (Chart 3).

The studies recorded three deaths of children and/or adolescents with COVID-19, and in two, presence of pre-existing disease/condition due to altered liver function was reported, without specifying age[40] and hydronephrosis with leukemia[18] in a 10-month-old child; the other study did not mention whether there was any pre-existing morbidity or the victim's age[38].

When analyzing the clinical manifestations cited by the studies included in the scoping review, more than one symptom or clinical sign was reported, the most frequent being fever, cough, and diarrhea (Figure 2).

Chart 2 - Characterization of the studies analyzed according to authors, country, type of study and number of participants (children and adolescents), Brazil, 2020

Authors	Country	Type of study	Number of children and adolescents
Zheng et al.,[8]	China	Cross-sectional	25 children
Dong et al.,[11]	China	NS	01 adolescent*
Escalera-Antezana et al.,[12]	Bolivia	Cross-sectional	02 adolescents*
Díaz et al.,[13]	Spain	Clinical case	01 child
Chen et al.,[14]	China	NS	04 children*
Xiang et al.,[15]	China	NS	06 children*
Peng e Zhang[16]	China	NS	01 child
Park et al.[17]	Korea	Clinical case	01 child
Lu et al.[18]	China	NS	171 children and adolescents*
Ng et al.[19]	China	NS	01 adolescent*
Wang et al.[20]	China	Clinical case	01 child
Cao et al.[21]	China	NS	02 children
Guan et al.[22]	China	Cross-sectional	09 children and adolescents*
Mansour et al.,[23]	Lebanon	Clinical case	01 child
Pan et al.[24]	China	Clinical case	01 child*
Sun et al.[25]	China	Cross-sectional	08 children and adolescents
Xu et al.,[26]	China	Cross-sectional	10 children and adolescents*
Shi et al.,[27]	China	Cross-sectional	10 children and adolescents*
Su et al.,[28]	China	Cross-sectional	09 children*
Tan et al.,[29]	China	Cross-sectional	10 children and adolescents
Xing et al.,[30]	China	Cross-sectional	3 children
Yin et al.,[31]	China	Cross-sectional	1 child
Chen et al.,[32]	China	Cross-sectional	12 children and adolescents*
Morey-Olivé et al.,[33]	Spain	Clinical cases	2 children
Liu et al.,[34]	China	Cross-sectional	04 children*
Chacón-Aguilar et al.,[35]	Spain	Clinical cases	01 child
Ji et al.,[36]	China	Clinical cases	01 child and 01 adolescent
Cai et al.,[37]	China	NS	10 children and adolescents
Dong et al.,[38]	China	NS	2135 children and adolescents
Xia et al.,[39]	China	NS	20 children and adolescents
Zhu et al.,[40]	China	Cross-sectional	10 children
Wei, et al.,[41]	China	Cross-sectional	09 children

*Note: *Studies that included other age groups as participants; NS - not specified.*

Chart 3 - Epidemiological profile (age group, probable contamination, pre-existing disease/condition and hospitalization) of children and adolescents with COVID-19 according to the authors, Brazil, 2020

Authors	Age group	Probable contamination of the disease	Pre-existing disease/condition	Hospitalization/ length (days)
Zheng et al.,[8]	0 - 6y	Travel history	Suspected hereditary metabolic diseases and congenital heart disease	Yes/10
Dong et al.,[11]	11y	NS	Heart failure	Yes/NS
Escalera-Antezana et al.,[12]	13 and 18y	Family transmission and NS	No	No
Díaz et al.,[13]	8d	Community transmission	Prematurity	Yes/13
Chen et al.,[14]	2 - 10y	Community transmission	No	Yes/NS
Xiang et al.,[15]	11m -9y	Family transmission	NS	Yes/NS
Peng e Zhang[16]	03y	Family transmission	No	NS
Park et al.[17]	10y	Family transmission	No	Yes/15
Lu et al.[18]	0 – 16y	Family transmission	Hydronephrosis and leukemia	NS
Ng et al.[19]	17y	Community transmission	No	No
Wang et al.[20]	36h	Vertical transmission	No	Yes/18

To be continued

Chart 3 (concluded)

Authors	Age group	Probable contamination of the disease	Pre-existing disease/condition	Hospitalization/ length (days)
Cao et al.[21]	03m	Family transmission	No	Yes/15
Guan et al.[22]	0 - 15y	Community transmission	No	NS
Mansour et al.,[23]	16m	Family transmission	*Infection for Streptococcus pneumoniae*	Yes/NS
Pan et al.[24]	03y	Family transmission	No	Yes/03
Sun et al.[25]	2m - 15y	Travel history and family transmission	NS	Yes/03 - 10
Xu et al.,[26]	2 meses a 15 anos	Community transmission	NS	NS
Shi et al.,[27]	7m - 11y	Travel history and community transmission	NS	Yes/10
Su et al.,[28]	11m a 9y	Family transmission	NS	Yes/NS
Tan et al.,[29]	1 - 12y	Travel history and family transmission	NS	Yes/20
Xing et al.,[30]	1 -6y	Family transmission	NS	Yes/NS
Yin et al.,[31]	9y	NS	NS	Yes/NS
Chen et al.,[32]	7m - 17y	Travel history and community transmission	NS	Yes/NS
Morey-Olivé et al.,[33]	2m e 6y	Community transmission	Cholestatic liver disease	Yes/NS
Liu et al.,[34]	11m - 9y	Community transmission	NS	NS
Chacón-Aguilar et al.,[35]	26d	NS	NS	Yes/06
Ji et al.,[36]	9 e 15y	Travel history	No	Yes/02
Cai et al.,[37]	3m - 10y	Family and community transmission	NS	Yes/NS
Dong et al.,[38]	2 -13y	Community transmission	NS	Yes/NS
Xia et al.,[39]	1d - 14y	Family transmission	NS	Yes/18 - 20
Zhu et al.,[40]	1 - 9d	Community transmission	Alteration of liver function	Yes/NS
Wei, et al.,[41]	28d - 1y	Family transmission	NS	NS

Note: h - hours; d - days; m - months; y - years; NS - not specified.

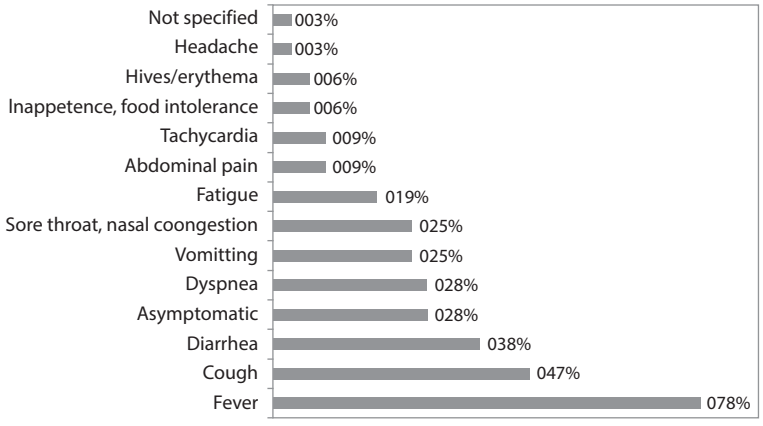

Figure 2 - Clinical manifestations described in the analyzed studies (n=32), Brazil, 2020

DISCUSSION

From this scoping review, it was possible to verify that the initial studies were developed, predominantly, in China, in 2020, with no Brazilian study concerning the disease in the studied population being identified. The fact is explained by the unexpected and recent emergence of SARS-CoV-2 infection in Wuhan, China, in December 2019[1]. COVID-19 has spread throughout the world and has grown to be one of the greatest challenges facing humanity. Since then, researchers from all countries and continents have aligned, in a joint and incessant search, to produce and make available information, experiences and knowledge capable of facing, controlling, treating and preventing the disease.

Although the methodology adopted in this review is not intended to assess the methodological rigor of the studies analyzed, it was found that they were more of a descriptive character, markedly cross-sectional, without specification as to the type of study. The urgency of new evidence at the beginning of the pandemic in China, may have instigated studies whose destination was more for the sharing of experiences and/or information of people affected by COVID-19, given the speed of dissemination and the absence of a defined treatment. In this sense, sharing this preliminary knowledge was more crucial for the moment than validating a study method.

Moreover, it was found that the authors did not address the socio-demographic distinctions of children and adolescents, such as race/color, education and/or socioeconomic conditions. Such information is significant because it gives a more detailed view of the population studied and because they may have considerable links with the health issue, in addition to instigating the proposition of strategies adapted to their needs.

Thus, it is essential to draw attention to the impact of situations of social and economic vulnerability in COVID-19 dissemination[42].

Less favored people of economic class are one of the groups most vulnerable to this pandemic. The protection measures guided by PAHO and WHO recommend certain procedures, such as cleaning hands with soap and water, using masks and 70% gel alcohol[2], which require additional costs in low-income families' expenses, which often does not have minimum conditions for basic sanitation and personal hygiene.

According to the United Nations Children's Fund (UNICEF), only three out of five people worldwide have basic requirements for correct hand hygiene[43]. In Brazil, a country marked by social inequalities, there is a great concern in relation to housing conditions, especially for those families who live in crowded and poorly ventilated environments, such as the peripheries of large centers. This housing factor contributes decisively to the faster spread of the disease.

In this perspective, studies describe that the contamination of the virus in children and adolescents occurred with a greater incidence through family transmission, followed by community transmission. Allied to the high transmissibility of the virus, transmission by contaminated droplets, due to the proximity to infected people or the contact with surfaces and objects used by the infected person, it was pointed out as the most frequent transmission[44]. As for vertical transmission, data are limited to date. Therefore, it is crucial to follow the precautions recommended during childbirth and birth care[20,45-46].

With regard to the laboratory diagnosis of SARS-CoV-2 in the children and adolescents participating in the studies analyzed, all of them accepted the WHO recommendations. That is, the RT-PCR test (Reverse-Transcriptase Polymerase Chain Reaction) and the serological test guarantee reliable standards for confirmation of COVID-19 by laboratories and professionals involved in the tests[47]. In the case of RT-PCR, the proof is obtained by sequencing nucleic acid, and, in serology, by the detection of antibodies as an immune response of the organism[47].

Another considerable element in the configuration of the epidemiological profile of children and adolescents with COVID-19 corresponds to pre-existing diseases or conditions. These can be taken as risk factors for the worsening of COVID-19 infection in the general population. Researchers point out that certain diseases, mainly those of the cardiovascular and immune systems, are the main responsible for the worsening of the infection in adults[48]2019, Wuhan, China, has experienced an outbreak of coronavirus disease 2019 (COVID-19). With regard to children and adolescents, WHO points out that the evidence on comorbidities considered to be risk factors for the worsening of cases is still incipient[49].

In the present scoping review, heart failure, prematurity, leukemia, hydronephrosis, streptococcal infection, changes/liver disease were classified as a pre-existing disease or condition. However, the studies analyzed did not assess comorbidities as risk factors for COVID-19 infection in children and adolescents, but rather for the worsening of the clinical picture in this age group[8,13,18,23,33,38,40]. Moreover, three studies reported death among three children or adolescents with COVID-19; of these, two reported pre-existing disease[18,40] and one did not specify[38]. Lu and collaborators[18] detected 171 children and adolescents positive for COVID-19; Dong et al.[38] registered 2,135 cases of the disease in this age group; Zhu et al[40] described the infection in ten newborns. In these studies, only one death was recorded in each of them.

Cai and collaborators[37] indicate that infection in children and adolescents with the SARS-CoV-2 virus, although it is characterized, in most cases, by mild or moderate manifestations, can result in cases that require hospitalization or even intensive care. Most of the studies mentioned the need for hospitalization for treatment of the disease, which can also be correlated to the places where the investigations took place, predominantly hospitals, centers and/or inpatient units for children and adolescents with COVID-19.

In the present study, fever, cough and diarrhea are among the most cited clinical manifestations. Chinese studies corroborate and point out fever as the most prevalent and consistent clinical sign with regard to COVID-19, especially in children[8,25,29-30,37]. Researchers from a study carried out with eight children and adolescents seriously ill by COVID-19 and admitted to the Intensive Care Unit of a Wuhan Children's Hospital identified that the most common signs were dyspnea, present in all cases, followed by fever and cough in six of the analyzed patients[25]. Lu and collaborators[18] point out that, in most cases of COVID-19 in children and adolescents, the predominant clinical characteristics were cough (48.5%), pharyngeal erythema (46.2%), and fever (41.5%).

The clinical evidence of COVID-19 in children and adolescents may differ in some ways, compared to other population groups. Among adults and elderly people, dyspnea is more common than gastrointestinal symptoms, such as diarrhea, considered as a poorly referenced manifestation among adults with the disease[3]. This was a different result from that noted in the present scoping review, in which most studies cited diarrhea as a typical clinical occurrence of COVID-19 in children and adolescents. Some studies have marked diarrhea as the third most common clinical sign present in 33.3%, 15% and 12% of the cases surveyed, respectively [8,32,39]. Others pointed out diarrhea as a clinical feature present in a smaller proportion[25-26] or only in severe cases[38].

In general, it can be inferred that clinical manifestations in children and adolescents are assessed as milder and/or moderate than those presented by adults, progressing less frequently to critical clinical conditions and/or deaths. The curbing of the disease may result from the organic functionalities of these individuals, as well as from presence/absence of pre-existing diseases or conditions, which, in addition to being distinct, are in a lower proportion in this age group than in adults.

Study limitations

The results of this review should also be weighted by criteria of limitations. There is an expressive daily increase in scientific publications on the subject, and the studies analyzed correspond to those available until April 2020, the period in which data collection occurred. Moreover, the research analyzed prioritized the characteristics relevant to the clinical course of COVID-19. Thus, the scientific evidence obtained in this review shows gaps in knowledge regarding the epidemiological profile, notably regarding color/race, education and socioeconomic conditions of children and adolescents with COVID-19.

It is also noteworthy the impossibility of specifying the outcome and behavior of the disease in Brazilian children and adolescents,

given that no studies carried out in the country were identified. However, despite these limitations, this review has the potential to foster and subsidize research that, in the future, takes into account the social, economic and family contours in COVID-19 dissemination and worsening in children and adolescents from different countries, developed and developing, like Brazil.

Contributions to nursing and health

Nursing is at the forefront of the global pandemic of the new SAR-Cov-2 and is considered a key member of health teams to control and prevent the spread of this new infectious disease[9]. The performance of these professionals is indispensable for health care at this time, at all levels of assistance, with roles that pertain to health education and screening of patients, surveillance and control of hospital infections, in addition to direct care for infected individuals. The emergence of the new disease COVID-19 imposes important challenges on nursing professionals with regard to the management and prognosis of infected people, especially children and adolescents.

It is important to highlight that the present scoping review gathered information from international studies on the epidemiological profile of children and adolescents with COVID-19. As it is a new disease, without treatment, with high dissemination and recognized as an international public health emergency, it can contribute to health care improvement for this specific population affected by the disease. Thus, health professionals, especially nurses, working in direct assistance to these patients and families, in teaching or research, will be able to use the results of the study on screen to subsidize lines of care, taking into account the epidemiological profile of children and adolescents who are falling ill with COVID-19 worldwide, as well as promoting new studies on the subject.

CONCLUSION

The results assessed in this review provided data to screen the epidemiological profile of children and adolescents with COVID-19. It was possible to categorize the studies submitted to the analysis, as well as to know information about age group, sex, probable source of disease contamination, presence of pre-existing disease/condition, hospitalization, deaths and clinical manifestations in children and adolescents with COVID-19. The main limitations they encounter are the absence of certain information, such as race/color, education and/or socioeconomic conditions of participants, not addressed by the studies analyzed in this review, and the absence of national studies on the topic of interest.

Thus, the relevance of investments in research that focuses on the previous health, social and economic conditions of children and adolescents with COVID-19, in different contexts, is reinforced, in order to establish measures to control, prevent and combat the disease that affects Brazil and societies worldwide.

FUNDING

PROPeq/PROPG-UFMT.

REFERENCES

1. Sun P, Lu X, Xu C, Sun W, Pan B. Understanding of COVID-19 based on current evidence. J Med Virol. 2020. doi: 10.1002/jmv.25722
2. Organização Pan-America da Saúde (OPAS). Folha informativa - COVID-19 (doença causada pelo novo coronavírus) [Internet]. 2020 [cited 2020 May 23]. Available from: https://www.paho.org/bra/index.php?option=com_content&view=article&id=6101:covid19&Itemid=875
3. Nascimento IJB, Cacic N, Abdulazeem HM, Groote TC von, Jayarajah U, Weerasekara I, et al. Novel Coronavirus Infection (COVID-19) in Humans: a scoping review and meta-analysis. J Clin Med. 2020;9(4):941. doi: 10.3390/jcm9040941
4. Singh S, Sharma BB. Severe acute respiratory syndrome-coronavirus 2 and novel coronavirus disease 2019: an extraordinary pandemic. Lung India. 2020;37(3):268-71. doi: 10.4103/lungindia.lungindia_170_20
5. World Health Organization (WHO). Coronavirus disease 2019 (COVID-19): Situation Report - 120 (19 May 2020) [Internet]. ReliefWeb [Internet]. 2020 [cited 2020 may 23]. Available from: https://reliefweb.int/report/world/coronavirus-disease-2019-covid-19-situation-report-120-19-may-2020
6. Sun P, Qie S, Liu Z, Ren J, Li K, Xi J. Clinical characteristics of hospitalized patients with SARS-CoV-2 infection: A single arm meta-analysis. J Med Virol. 2020. doi: 10.1002/jmv.25735
7. Safadi MAP. The intriguing features of COVID-19 in children and its impact on the pandemic. J Pediatr. 2020. doi: 10.1016/j.jped.2020.04.001
8. Zheng F, Liao C, Fan Q, Chen H, Zhao X, Xie Z, et al. Clinical characteristics of children with Coronavirus Disease 2019 in Hubei, China. Curr Med Sci. 2020;40(2):1–6. doi: 10.1007/s11596-020-2172-6
9. Chen S, Lai Y, Tsay S. Nursing Perspectives on the Impacts of COVID-19. J Nurs Res. 2020;28(3). doi: 10.1097/NRJ.0000000000000389
10. Peters M, Godfrey C, McInerney P, Munn Z, Tricco A, Khalil H. Chapter 11: scoping reviews - JBI Reviewer's Manual - JBI GLOBAL WIKI [Internet]. Joanna Briggs Institute Reviewer's Manual - JBI. 2020 [cited 2020 May 25]. Available from: https://wiki.joannabriggs.org/display/MANUAL/Chapter+11%3A+Scoping+reviews
11. Dong N, Cai J, Zhou Y, Liu J, Li F. End-stage Heart Failure with COVID-19: strong evidence of myocardial injury by 2019-nCoV. JACC: Heart Failure. 2020. doi: 10.1016/j.jchf.2020.04.001
12. Escalera-Antezana JP, Lizon-Ferrufino NF, Maldonado-Alanoca A, Alarcón-De-la-Vega G, Alvarado-Arnez LE, Balderrama-Saavedra MA, et al. Clinical features of the first cases and a cluster of Coronavirus Disease 2019 (COVID-19) in Bolivia imported from Italy and Spain. Travel Med Infect Dis. 2020. doi: 10.1016/j.tmaid.2020.101653

13. Díaz CA, Maestro ML, Pumarega MTM, Antón BF, Alonso CRP. Primer caso de infección neonatal por SARS-CoV-2 en España. An Pediatr. 2020;92(4):237-8. doi: 10.1016/j.anpedi.2020.03.002

14. Chen C, Gao G, Xu Y, Pu L, Wang Q, Wang L, et al. SARS-CoV-2–Positive Sputum and Feces After Conversion of Pharyngeal Samples in Patients With COVID-19. Ann Intern Med. 2020;M20-0991. doi: 10.7326/M20-0991

15. Xiang M, Liang S, Zhang Y, Zhang X, Gai Z, Zhang Z. Do children need a longer time to shed SARS-CoV-2 in stool than adults? J Microbiol, Immunol Infect. 2020. doi: 10.1016/j.jmii.2020.03.010

16. Peng A, Zhang M. Novel coronavirus SARS-CoV-2: familial spread resulting in COVID-19 pneumonia in a pediatric patient. Diagn Interv Radiol. 2020;26(3):262–3. doi: 10.5152/dir.2020.20157

17. Park JY, Han MS, Park KU, Kim JY, Choi EH. First Pediatric Case of Coronavirus Disease 2019 in Korea. J Korean Med Sci. 2020;35(11):e124. doi: 10.3346/jkms.2020.35.e124

18. Lu X, Zhang L, Du H, Zhang J, Li YY, Qu J, et al. SARS-CoV-2 Infection in Children. New England J Med. 2020;382(17):1663-5. doi: 10.1056/NEJMc2005073

19. Ng O-T, Marimuthu K, Chia P-Y, Koh V, Chiew CJ, De Wang L, et al. SARS-CoV-2 Infection among Travelers Returning from Wuhan, China. N Engl J Med. 2020;382(15):1476-8. doi: 10.1056/NEJMc2003100

20. Wang S, Guo L, Chen L, Liu W, Cao Y, Zhang J, et al. A case report of neonatal COVID-19 infection in China. Clin Infect Dis. 2020. doi: 10.1093/cid/ciaa225

21. Cao Q, Chen Y-C, Chen C-L, Chiu C-H. SARS-CoV-2 infection in children: Transmission dynamics and clinical characteristics. J Formosan Med Assoc. 2020;119(3):670-3. doi: 10.1016/j.jfma.2020.02.009

22. Guan W, Ni Z, Hu Y, Liang W, Ou C, He J, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. N Engl J Med. 2020;382(18):1708-20. doi: 10.1056/NEJMoa2002032

23. Mansour A, Atoui R, Kanso K, Mohsen R, Fares Y, Fares J. First Case of an Infant with COVID-19 in the Middle East. Cureus. 2020. doi: 10.7759/cureus.7520

24. Pan X, Chen D, Xia Y, Wu X, Li T, Ou X, et al. Asymptomatic cases in a family cluster with SARS-CoV-2 infection. Lancet Infect Dis. 2020;20(4):410-1. doi: 10.1016/S1473-3099(20)30114-6

25. Sun D, Li H, Lu X-X, Xiao H, Ren J, Zhang F-R, et al. Clinical features of severe pediatric patients with coronavirus disease 2019 in Wuhan: a single center's observational study. World J Pediatr. 2020. doi: 10.1007/s12519-020-00354-4

26. Xu Y, Li X, Zhu B, Liang H, Fang C, Gong Y, et al. Characteristics of pediatric SARS-CoV-2 infection and potential evidence for persistent fecal viral shedding. Nat Med. 2020;26(4):502-5. doi: 10.1038/s41591-020-0817-4

27. Shi Y, Wang X, Liu G, Zhu Q, Wang J, Yu H, et al. A quickly, effectively screening process of novel corona virus disease 2019 (COVID-19) in children in Shanghai, China. Ann Transl Med. 2020;8(5):241-241. doi: 10.21037/atm.2020.03.22

28. Su L, Ma X, Yu H, Zhang Z, Bian P, Han Y, et al. The different clinical characteristics of corona virus disease cases between children and their families in China - the character of children with COVID-19. Emerg Micr Infect. 2020;9(1):707-13. doi: 10.1080/22221751.2020.1744483

29. Tan Y, Tan B, Pan J, Wu J, Zeng S, Wei H. Epidemiologic and clinical characteristics of 10 children with coronavirus disease 2019 in Changsha, China. J Clin Virol. 2020;127:104353. doi: 10.1016/j.jcv.2020.104353

30. Xing Y-H, Ni W, Wu Q, Li W-J, Li G-J, Wang W-D, et al. Prolonged viral shedding in feces of pediatric patients with coronavirus disease 2019. J Microbiol, Immunol Infect. 2020. doi: 10.1016/j.jmii.2020.03.021

31. Yin X, Dong L, Zhang Y, Bian W, Li H. A mild type of childhood Covid-19: a case report. Radiol Infect Dis. 2020. doi: 10.1016/j.jrid.2020.03.004

32. Chen J, Zhang Z-Z, Chen Y-K, Long Q-X, Tian W-G, Deng H-J, et al. The clinical and immunological features of pediatric COVID-19 patients in China. Genes Dis. 2020. doi: 10.1016/j.gendis.2020.03.008

33. Morey-Olivé M, Espiau M, Mercadal-Hally M, Lera-Carballo E, García-Patos V. Manifestaciones cutáneas en contexto del brote actual de enfermedad por coronavirus 2019. An Pediatr. 2020. doi: 10.1016/j.anpedi.2020.04.013

34. Liu H, Liu F, Li J, Zhang T, Wang D, Lan W. Clinical and CT imaging features of the COVID-19 pneumonia: focus on pregnant women and children. J Infect. 2020;80(5):e7-13. doi: 10.1016/j.jinf.2020.03.007

35. Chacón-Aguilar R, Osorio-Cámara JM, Sanjurjo-Jimenez I, González-González C, López-Carnero J, Agapito BP-M-. COVID 19: sindrome febril y clínica neurólogica en neonato. An Pediatr. 2020. doi: 10.1016/j.anpedi.2020.04.012

36. Ji L-N, Chao S, Wang Y-J, Li X-J, Mu X-D, Lin M-G, et al. Clinical features of pediatric patients with COVID-19: a report of two family cluster cases. World J Pediatr. 2020. doi: 10.1007/s12519-020-00356-2

37. Cai J, Xu J, Lin D, Yang Z, Xu L, Qu Z, et al. A Case Series of children with 2019 novel coronavirus infection: clinical and epidemiological features. Clin Infect Dis. 2020;ciaa198. doi: 10.1093/cid/ciaa198

38. Dong Y, Mo X, Hu Y, Qi X, Jiang F, Jiang Z, et al. Epidemiology of COVID-19 among children in China. Pediatrics. 2020. doi: 10.1542/peds.2020-0702

39. Xia W, Shao J, Guo Y, Peng X, Li Z, Hu D. Clinical and CT features in pediatric patients with COVID-19 infection: Different points from adults. Pediatr Pulmonol. 2020;55(5):1169-74. doi: 10.1002/ppul.24718

40. Zhu H, Wang L, Fang C, Peng S, Zhang L, Chang G, et al. Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia. Transl Pediatr. 2020;9(1):51-60. doi: 10.21037/tp.2020.02.06

41. Wei M, Yuan J, Liu Y, Fu T, Yu X, Zhang Z-J. Novel coronavirus infection in hospitalized infants under 1 year of age in China. JAMA. 2020;323(13):1313. doi: 10.1001/jama.2020.2131

42. Nunes J. The COVID-19 pandemic: securitization, neoliberal crisis, and global vulnerabilization. Cad Saúde Pública. 2020;36(5). doi: 10.1590/0102-311x00063120

43. Fundo das Nações Unidas para a Infância (UNICEF). Lavar as mãos com sabão - fundamental na luta contra o coronavírus – está "fora de alcance" para bilhões [Internet]. 2020 [cited 2020 May 23]. Available from: https://www.unicef.org/brazil/comunicados-de-imprensa/lavar-maos-com-sabao-fundamental-contra-coronavirus-fora-de-alcance-de-bilhoes

44. World Health Organization (WHO). Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations: Scientific Brief[Internet]. 2020 [cited 2020 May 12]. Available from: https://apps.who.int/iris/bitstream/handle/10665/331601/WHO-2019-nCoV-Sci_Brief-Transmission_modes-2020.1-eng.pdf

45. Chen H, Guo J, Wang C, Luo F, Yu X, Zhang W, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. Lancet. 2020;395(10226):809-15. doi: 10.1016/S0140-6736(20)30360-3

46. Karimi-Zarchi M, Neamatzadeh H, Dastgheib SA, Abbasi H, Mirjalili SR, Behforouz A, et al. Vertical transmission of Coronavirus Disease 19 (COVID-19) from infected pregnant mothers to neonates: a review. Fetal Pediatr Pathol. 2020;1-5. doi: 10.1080/15513815.2020.1747120

47. World Health Organization (WHO). Laboratory testing for coronavirus disease (COVID-19) in suspected human cases [Internet]. Interim guidance; 2020 [cited 2020 May 22]. Available from: https://apps.who.int/iris/handle/10665/331329?locale-attribute=pt&

48. Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet. 2020;395(10229):1054-62. doi: 10.1016/S0140-6736(20)30566-3

49. World Health Organization (WHO). Multisystem inflammatory syndrome in children and adolescents with COVID-19: Scientific Brief[Internet]. 2020 [cited 2020 May 15]. Available from: https://www.who.int/publications-detail/multisystem-inflammatory-syndrome-in-children-and-adolescents-with-covid-1