

Repercussions of COVID-19 on the morbidity and mortality of indigenous children: integrative review

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Graphic Abstract



Abstract

The disease caused by COVID-19 had an impact on the health of indigenous communities, with hospitalization and death rates, mainly in the children's segment. The objective of the study was to identify scientific evidence about the repercussions of COVID-19 on the morbidity and mortality of indigenous children. This is an integrative review study with the research question: What are the repercussions of the COVID-19 pandemic on indigenous children? The PUBMED, WEB OF SCIENCE, LILACS and SCOPUS data sources were accessed during the month of December 2023 with the search strategies: “indigenous population” AND “child” AND “coronavirus infections” and “native” AND “child” AND “coronavirus infections”, taking 2020 as the epidemiological milestone. Based on the inclusion criteria, nine scientific productions were selected. After interpreting the results, it was identified that indigenous children have a higher risk of mortality compared to non-indigenous children of the same age. This may be related to increased vulnerability, difficulty accessing food and prematurity. It was concluded that indigenous children had higher mortality rates and other implications related to COVID-19 and repercussions related to existing social inequalities and vulnerabilities that increased with the pandemic. The scarce scientific production regarding the indigenous population stands out, especially with regard to children.

Keywords: Children's Health. Health of Indigenous Populations. COVID-19.

INTRODUCTION

COVID-19, a disease caused by SARS-CoV-2, resulted in a difficult-to-control pandemic, which generated a health and humanitarian crisis worldwide. The initial scenario was Wuhan, China, in December 2019, but by March 2020 there were already confirmed cases on all continents, causing political, economic, social, environmental and individual repercussions¹.

In Brazil, the first case of COVID-19 occurred on February 25, 2020 and according to data from the Ministry of Health, in August, the country had already recorded 3,057,470 confirmed cases and 101,752 deaths, ranking second in absolute numbers in the world². According to the 2022 IBGE Demographic Census, the indigenous population is made up of 1.7 million individuals, which represents 0.83% of the total population. Of the 5,570 cities in the country, 4,832 have indigenous residents (86.8%)³, and children represent 43% of the 896 thousand indigenous people in Brazil⁴.

In the Brazilian indigenous population, 56,385 cases of 1,129 deaths caused by COVID-19 among 163 peoples were recorded as of July 2021, according to the Articulation of Indigenous Peoples in Brazil (APIB). Furthermore, the mortality rate of indigenous people up to 19 years of age due to COVID-19 is higher than that of the Brazilian population in the same age group⁵.

Consequently, the COVID-19 pandemic in Brazil highlighted the political, social and environmental vulnerability of indigenous peoples. Since a large part of these indigenous people live in indigenous lands, where there are precarious conditions of sanitation, housing, low education and an increase in early mortality, and are often located, geographically, in places that make access to health services difficult. In view of this, several national and international entities warned that measures should be taken by the government to control the spread of

the disease, minimizing the impact on this population^{6,7}.

On the other hand, in the period prior to the COVID-19 pandemic, acute respiratory infections were already among the main causes of morbidity and mortality in indigenous populations in Brazil, mainly affecting the children's segment⁸. Furthermore, the introduction of respiratory viruses into indigenous communities has a high potential for contagion, resulting in high hospitalization rates and the potential to cause deaths⁹.

From this perspective of the vulnerability of indigenous peoples, data from the Special Secretariat for Indigenous Health (SESAI) points to factors that increase the risk of indigenous infant mortality. Among them, health, housing, food and cultural conditions stand out, access for health teams to indigenous territories, right to land, food and nutritional security, access to education and other human rights¹⁰.

In this direction, the National Policy for Comprehensive Children's Health Care emphasizes attention to indigenous peoples, which aims to provide them with the right to access to health, recognizing their social and cultural organization. However, despite effective actions to promote the health of indigenous children, the Infant Mortality Rate is still higher compared to other Brazilian children¹¹.

In view of this, this review study aims to contribute to the construction of knowledge about the indigenous population, especially children, and is aligned with axis 13 - Indigenous Health of the Ministry of Health's Research Priorities Agenda with signs for community health child¹². Furthermore, this review study is in line with the 2030 Sustainable Development agenda, which reinforces support for the needs of indigenous people, as people who are vulnerable¹³. The objective was to identify scientific evidence about the repercussions of COVID-19 on the morbidity and mortality of indigenous children.

METHOD

This is an integrative review study, which followed the following steps: (1) establishment of the theme and selection of the hypothesis or research question; (2) establishment of criteria for inclusion and exclusion of studies, sampling or literature search; (3) definition of information to be extracted from selected studies and categorization of studies; (4) evaluation of included studies; (5) interpretation of results; (6) presentation of the review and synthesis of knowledge¹⁴. Which sought answers to this research question: “what are the repercussions of the COVID-19 pandemic on indigenous children?”. This question was elaborated based on the elements of the PICO strategy, which corresponds to the acronym of the letters referring to the words, being: P (population) – indigenous children; I (phenomenon of interest) – repercussions of the COVID-19 pandemic and Co (context) – any geographic context¹⁵.

As inclusion criteria: original research articles on the topic with the indigenous children population, which answered the review question, in English, Spanish or Portuguese, with an epidemiological milestone from 2020, the beginning of the COVID-19 pandemic¹.

Sampling took place in the Latin American and Caribbean Literature in Health Sciences (LILACS) data sources, through the Regional Portal of the Virtual Health Library (VHL), National Library of Medicine (PubMed), Web of Science and SciVerse Scopus (SCOPUS), accessed via the Coordination for the Improvement of Higher Education Personnel (CAPES) portal. The use of these databases is justified by the fact that these repositories are internationally recognized for their wide coverage of scientific literature in different areas of knowledge in different contexts.

The search terms were combined using the Boolean operator AND, using descriptors according to Medical Subject Heading (MeSH) and Health Sciences Descriptors (DeCS).

The search strategies were adapted for each database according to their specificities. Initially, the terms were mapped for each PICO acronym, using descriptors and synonyms in Portuguese, and Mesh and keywords in English. In the process of searching attempts using the acronyms and their respective descriptors, that is, in the intersections combining the descriptors and synonyms (“indigenous population”, “native”, “child”, “coronavirus infections”) with the Boolean operator AND arrived- based on the three feasible strategies to be carried out, in the databases mentioned above, with the purpose of integrating and directing as many studies on the topic as possible that addressed the review question and the objective of the review. The search syntax is described in Table 1.

The search in data sources took place in December 2023. 69 records were found in the LILACS database, 179 in Pubmed, 127 in Web of science and 12 in SCOPUS, totaling 338 records. Initially, titles and abstracts that met the inclusion criteria were read, totaling 9 articles.

It is noteworthy that the identification of a small number of studies on the topic does not necessarily represent a limitation, but rather highlights a significant gap in existing knowledge. As pointed out by Silva¹⁶ (2021), the lack of comprehensive and specific research on indigenous populations in public health contexts, such as the COVID-19 pandemic, reveals a systematic neglect in relation to these marginalized communities.

Table 1 - Descriptors, keywords and search expressions used, Santa Maria, RS, Brazil, 2024.

Databases	Search strategies
VHL	“indigenous population” AND “child” AND “coronavirus infections”
LILACS and SCOPUS	“native” AND “child” AND “coronavirus infections”
WEB OF SCIENCE and PUBMED	native AND child AND coronavirus infections

Two instruments were used to extract data from research studies. The first was organized based on a table containing the article indicator number, reference and inclusion criteria: not an article (NA), not in the language (NI), not research (NP), not on the topic (NT) and does not answer the review question (NQ). The second is a table with information on the article indicator number, reference, year, research objective, methodological design, research scenario, results, conclusions and level of evidence¹⁷.

The search for studies was carried out by three review researchers (R1, R2, R3), with expertise in searching for data, independently and simultaneously in the databases. Disagreements were resolved by consensus meeting, with comparison of search results and verification of differences in findings. In view of this, the selection differences between the two researchers (R1 and R2) were discussed and analyzed by researcher R3 to obtain consensus.

The hierarchical classification, regarding the level of evidence of the study, considered the type of research question of the selected articles. When the issue is related to treatment/intervention, there is a hierarchical classifica-

tion into VII levels; when it is prognostic/etiological, on five levels; and meaning/experience/understanding, on five levels¹⁸. Therefore, studies with higher levels of evidence, such as randomized clinical trials or systematic reviews, tend to provide more well-founded and generalizable conclusions about the repercussions of the pandemic on indigenous children. On the other hand, lower-level evidence, such as case reports or expert opinions, can offer important insights, but with a lower degree of certainty and validity. When analyzing and integrating the results of studies with different levels of evidence, researchers took into account the heterogeneity of the data and the methodological quality of each study.

The interpretation of the results was based on the answer to the review question. The presentation of the review comprises the synthesis of knowledge, developed in relation to the repercussions of COVID-19 on indigenous children. These steps constitute the results and discussion.

In relation to ethical aspects, Legislation 9,160 on copyright¹⁹ was respected, such as citing the authors of selected articles and preserving the ideas, concepts and findings presented in the investigations.

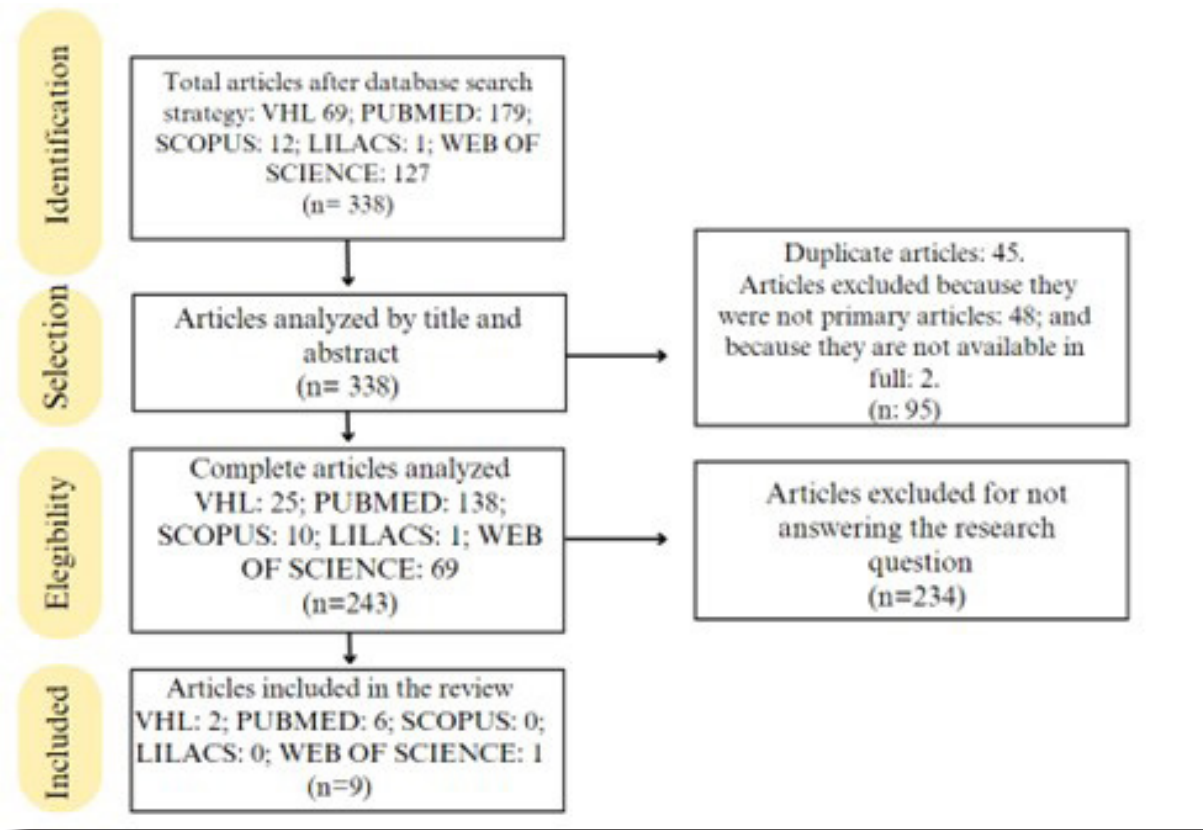
RESULTS

When characterizing the studies, it was found that the articles were published as follows: in 2020, with one article²⁰; 2021, with an article²¹; 2022, with six articles²²⁻²⁷ and 2023 with one article²⁸. As for the country of studies, the United States of America stood out with the most publications – five articles^{21,24-26,28}, three articles from Brazil^{20,22,27} and one article from New Zealand²³. The studies found are from the health area and have authors from different areas – Medicine^{21,26,27}, Nursing^{21,22}, Other areas^{25,28}, Spee-

ch Therapy²⁰, Nutrition²³ and Biology²⁴.

Regarding levels of evidence, seven^{21,22,24-28} are prognosis/etiology studies at evidence level IV; one for significance at evidence level IV²³; and one for diagnosis at evidence level VI²⁰.

In the search, 338 productions were found, of which 45 were duplicates and 09 were included in the study corpus. Below, Figure 1 presents the flowchart of article selection for the integrative review, based on the PRISMA model²⁹.



Prepared based on the PRISMA diagram²⁹.

Figure 1 - Flowchart of the article search and selection process. Santa Maria, RS, Brazil, 2024.

In Table 2, below, the characteristics of the articles are presented in terms of title, authors, country, year of publication, objective, methodological design, study scenario, results, conclusions and level of evidence.

Table 2 - Characteristics of the articles selected for integrative review. Santa Maria, RS, Brazil, 2024.

Code	Reference/year	Objective	Outlining	Setting	Results	Conclusions	Evidence level
A1	Hillesheim D. 2020 ²⁰	To describe the profile of deaths and lethality of Severe Acute Respiratory Syndrome (SARS) caused by COVID-19 in hospitalized children and adolescents in Brazil.	Notifications of children and adolescents (0 to 19 years old) hospitalized for SARS caused by COVID-19	Brazil	6,989 hospitalizations were investigated, of which 661 resulted in death, resulting in a hospital mortality rate of 9.5%. There was a higher mortality rate among children under 1 year of age (14.2%), female children and adolescents (9.7%), indigenous people (23.0%) and residents in rural areas (18.1%), as well as in the Northeast (15.4%) and North (9.7%) regions of the country.	Differences in hospital mortality were observed, depending on sociodemographic characteristics and marked regional and ethnic inequalities.	V/I/D

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Code	Reference/ year	Objective	Outlining	Setting	Results	Conclusions	Evidence level
A2	Karasek D. 2021 ²¹	To assess the prevalence of COVID-19 diagnosis in pregnancy and the association of COVID-19 infection and preterm birth among racially and ethnically diverse populations and people with chronic conditions.	QL-QT carried out with live births in California.	USA	3.7% reported a diagnosis of COVID-19 during pregnancy (n=8,957). The American Indian/Alaskan Native population represented 0.03% of the total, but the highest risk of preterm labor was observed in births of American Natives/Alaskan Natives with COVID-19 compared to those without (28.6% vs. 12.3%; aRR 2.7 [1.3, 5.7]), as well as in Asian deliveries (12.0% vs. 8.4%; aRR 1.6 [1.3, 2.1]).	A diagnosis of COVID-19 is associated with a 40% increased risk of preterm birth (<37 weeks), a 60% increased risk of very preterm birth (<32 weeks), and a 10% increased risk of preterm birth (37-38 weeks) In California, COVID-19 diagnosis rates in pregnant women have continued to rise across all race/ethnicity groups, but are disproportionately higher among Latinas, Native Americans/Alaskan Natives, and Native Hawaiians/Pacific Islanders. The elevated risk of preterm labor with a COVID-19 diagnosis for Native Americans/Alaskan Natives highlights the disproportionate burden of infection and mortality experienced by this population.	IV/P
A3	Faria RM. 2022 ²²	Analyze the mortality rate from COVID-19 among children and adolescents, considering geographic variations, by age and race/color.	QL-QT 44,186,064 deaths from COVID-19 among children and adolescents aged 0 to 14 years.	Brazil	The age group with the highest mortality rate was 1 to 4 years old, with deaths being more frequent in the brown and indigenous population.	Distribution of deaths from COVID-19 is uneven in Brazil, varying by age groups and race/color.	IV/P
A4	McKelvie-Sebileau P. 2022 ²³	Mapping the causes of the increase in obesity in indigenous children.	QL Interview with Maoris, education managers, health representatives, local councilors, about food systems in Hawke's Bay - New Zealand and the relationship with the increase in childhood obesity among indigenous children.	New Zealand	The COVID-19 lockdown has exacerbated inequalities related to Indigenous children's access to nutritious food.	When proposing health initiatives, it is important to integrate indigenous knowledge and work with the community.	IV/S
A5	Holmes L Jr. 2022 ²⁴	Assess the cumulative incidence of SARS-CoV-2, COVID-19 hospitalization, and ICU admission in relation to racial differences.	QT-QL Cross-sectional non-experimental epidemiological design	USA	The incidence was 96,376, while ICU admission was 12,448. A2,28) Native Americans/Alaskan Natives were 2 times more likely to be admitted to the ICU, pRR = 2.54, 99% CI = 0.82-7.85.	Racial disparities in pediatric COVID-19 hospitalization and ICU admission have been observed, with Black/AA individuals bearing the disproportionate burden of hospitalization and ICU admission in the US. Furthermore, compared to their white counterparts, Asian Americans and Native Americans/Alaskan Natives experienced an excessive burden of ICU admission relative to their white counterparts. These findings suggest the need to evaluate factors associated with increased transmissibility of SARS-CoV-2, disease severity, hospitalization, and ICU admission among children in the US.	IV/P

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Code	Reference/ year	Objective	Outlining	Setting	Results	Conclusions	Evidence level
A6	Bornstein ER. 2022 ²⁵	To describe characteristics, clinics, and outcomes of multisystem inflammatory syndrome in children among Native Americans/Alaskan Natives compared with non-Hispanic white people.	QT Descriptive study	USA	Compared with non-Hispanic white patients), Native American/Alaskan Native patients more frequently experienced shock (P = 0.035) and severe respiratory involvement (P = 0.006), including pneumonia (P = 0.009) and receiving supplemental oxygen high flow (P = 0.003). Length of stay was significantly shorter in non-Hispanic white patients [5 days (IQR 4–8)] than in Native American/Alaskan Native patients [5 days (IQR 3–7); P = 0.049]; no statistically significant differences were identified in care at the intensive care unit level (P = 0.469) or death (P = 0.112).	The higher proportion of Native American/Alaskan Native patients experiencing respiratory complications relative to non-Hispanic white patients may be partially attributed to the possible misclassification of patients with severe acute COVID-19 as patients with MIS-C, especially since patients American Indians/Alaskan Natives were disproportionately reported early in the pandemic when diagnostic algorithms may have been less clear. Although these cases were identified from a large national surveillance dataset, a limitation was the relatively small size of this Native American/Alaskan Native MIS-C cohort, which inhibited detailed subgroup analyses. More than 75% of Native American/Alaskan Native patients in this analysis were <12 years of age, reflecting a younger age distribution of MIS-C among U.S. Native American/Alaskan Native populations versus non-Hispanic white patients.	IV/P
A7	Qeadan F. 2022 ²⁶	To evaluate the risk of newly diagnosed type 1 diabetes <i>mellitus</i> after COVID-19 diagnosis and the impact of COVID-19 diagnosis on the risk of diabetic ketoacidosis in patients previously diagnosed with type 1 diabetes <i>mellitus</i> .	QT-QL Cohort study. Retrospective patient data from Cerner Real-World Data was used.	USA	The odds of developing new-onset type 1 diabetes <i>mellitus</i> were significantly increased in patients diagnosed with COVID-19 (OR: 1.42, 95% CI: 1.38, 1.46) compared to those without COVID-19. The risk varied by demographic groups, with the highest risk among pediatric patients aged 0-1 year (OR: 6.84, 95% CI: 2.75, 17.02) Native American /Alaskan Natives (OR: 2.30, 95% CI: 1.86, 2.82), Asian or Pacific Islanders (OR: 2.01, 95% CI: 1.61, 2.53) The odds of developing diabetic ketoacidosis for those with COVID-19 were significantly higher (OR 2.26, 95% CI: 2.04, 2.50) than those without COVID-19, and the highest risk was among patients with higher Elixhauser Comorbidity Index.	Diagnosis of COVID-19 is associated with a significantly increased risk of new onset, and Native American/Alaskan Native, Asian/Pacific Islander, and Black populations are disproportionately at risk. In patients with pre-existing type 1 diabetes <i>mellitus</i> , the risk of developing diabetic ketoacidosis increases significantly after a diagnosis of COVID-19.	IV/P
A8	Soares MCB. 2022 ²⁷	To analyze the profile of hospitalizations and factors associated with deaths of Brazilian children and adolescents with Severe Acute Respiratory Syndrome caused by COVID-19.	QL Cross-sectional study	Brazil	The prevalence of hospitalization among children and adolescents was 3.6% and the case fatality rate was 4.0%. Higher mortality rates occurred among adolescents, indigenous people, rural residents, residents in the North and Northeast regions of Brazil and those who became seriously ill and had comorbidities. The length of stay was longer for adolescents who became seriously ill or had comorbidities. The greatest chance of death was associated with: children under one year of age and adolescents, natives and residents of the North, Northeast and Southeast regions, who became seriously ill and had comorbidities.	Despite hospitalization and mortality rates lower than those in adults, the prevalence, complications and mortality from COVID-19 in the pediatric population are relevant. Knowledge of the profile of children and adolescents hospitalized due to COVID-19 and the factors associated with these deaths allows us to guide response efforts aimed at serving this vulnerable population.	IV/P

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Code	Reference/ year	Objective	Outlining	Setting	Results	Conclusions	Evidence level
A9	Tabet M . 2023 ²⁸	To examine the prevalence and risk and protective factors for delayed or missed pediatric preventive care in the US due to the COVID-19 pandemic, stratified by race and ethnicity to assess associations by groups.	QT-QL Cross-sectional study	USA	Of the 50,892 NSCH respondents, 48.9% were women and 51.1% were men; the mean (SD) age was 8.5 (5.3) years. With regards to race and ethnicity, 0.4% were Native American or Alaskan Native. Overall, 27.6% of children delayed or missed pediatric preventive care due to the COVID-19 pandemic with 24.3% of them being American Indian or Alaska Native. Pacific Islanders (prevalence ratio [PR], 1.16 [95% CI, 1.02-1.32]), Hispanic children (PR, 1.19 [95% CI, 1.09-1.31]) and multiracial children (PR, 1.23 [95% CI, 1.11-1.37]) were more likely to have delayed or missed preventive care compared with non-Hispanic white children. Among non-Hispanic black children, risk and protective factors included age 6 to 8 years (vs 0-2 years [PR, 1.90 (95% CI, 1.23-2.92)]) and difficulty covering basic needs somewhat or very frequently (vs never or rarely [PR, 1.68 (95% CI, 1.35-2.09)]). Among multiracial children, risk and protective factors included age 9 to 11 years (vs 0-2 years [PR, 1.73 (95% CI, 1.16-2.57)]), lower family income (<100% vs ≥400% federal poverty level: 0.52 [0.35-0.79]) and 2 or more vs 0 health conditions (PR, 1.54 [95% CI, 1.14- 2.08]). Among non-Hispanic white children, risk and protective factors included older age (9-11 years vs 0-2 years [PR, 2.05 (95% CI, 1.78-2.37)]), 4 or more children vs 1 child in the household (PR, 1.22 [95% CI, 1.07-1.39]), fair or poor vs excellent or very good caregiver health (PR, 1.32 [95% CI, 1.18-1.47]), difficulty in covering basic needs somewhat or very frequently (vs. never or rarely [PR, 1.36 (95% CI, 1.22-1.52)]), perception of good versus excellent or very good child health (PR, 1.19 [95% CI, 1.06-1.34]) and 2 or more versus 0 health conditions (PR, 1.25 [95% CI, 1.12 -1.38]).	The prevalence of and risk factors for delayed or missed pediatric preventive care occurred during the COVID-19 pandemic and varied by race and ethnicity..	IV/P

DISCUSSION

Regarding the category of the relationship between hospitalization and mortality of indigenous children due to COVID-19, a study developed in Brazil²⁰ investigated 6,989 notifications of children and adolescents aged 0 to 19 years hospitalized for Severe Acute Respiratory Syndrome (SARS), caused by COVID-19, and revealed a higher mortality rate in children under 1 year of age (14.2%), females (9.7%), indigenous people (23%) and residents of rural areas (18.1%), in the Northeast region (15.4%) and North (9.7%). Another study, carried out in the USA²⁵, points out that, of the 8,561 cases of multisystem inflammatory syndrome in children, 69 (0.9%) were Native Americans and Alaska Natives, more than 75% in this analysis were <12 years old, obese and from areas of greater social vulnerability. Furthermore, a study²⁴ with pediatric COVID-19 data found that the cumulative incidence of hospitalization was 96,376, while ICU admission was 12,448, with American Indians/Alaskan Natives being twice as likely to be admitted to the ICU.

Likewise, a Brazilian study analyzed 44,186,064 deaths of children and adolescents aged 0 to 14 years due to COVID-19, revealing an increased mortality rate in the age group 1 to 4 years and in the brown and indigenous population²². The Ministry of Health revealed that, by the 46th epidemiological week of 2022, 688,920 people had died from COVID-19 in Brazil, of which 43 were indigenous and among them, 6 were children up to 9 years old³². Researchers from Minas Gerais³³ who evaluated the risk factors for death from COVID-19 in the child population, pointed out that indigenous children in Brazil have at least twice the risk of dying from COVID-19 when compared to children of other ethnicities.

Likewise, another Brazilian study also showed a prevalence of 3.6% of hospitalization among children and adolescents, and the lethality rate was 4.0% with higher rates among adolescents, indigenous people, rural

residents, residents in the North and Northeast regions of Brazil. Brazil, pointing out ethnic and racial inequality in the country²⁷.

Regarding the implications of COVID-19 on access to healthcare for indigenous children, a study carried out in the USA²⁸ with 50,892 parents and caregivers of children aged 0 to 17, with data related to the loss of preventive care due to the COVID-19 pandemic, pointed out that of these 0.4% of children were Native American or Alaska Native. No risk factors were identified in this group, possibly due to other barriers to care that were not presented in the study, such as difficulty in access, availability and waiting time for appointments.

Also, when it comes to difficulty in access, studies³⁵⁻³⁶ cite the problem of the lack of accessibility of the indigenous population to health services, due to the location of many villages being difficult to access and in cases of emergencies in which they require transfer to specialized services, river and air transport was an existing difficulty.

Furthermore, in many cases, the indigenous people themselves did not accept being transported, a situation that can be related to the complexity of linguistic issues and traditions involving health and illness³⁵. It should be noted that this is not a reality exclusive to Brazil, a study from Canada highlighted unemployment, transportation needs and linguistic and cultural vulnerabilities as factors that encourage negative consequences of the COVID-19 pandemic³⁶.

In relation to the vulnerabilities and risk factors in the health conditions of indigenous peoples during the COVID-19 pandemic, it is highlighted that these circumstances impact their health condition and are related to socioeconomic, cultural, geographic and political factors. Poverty, the lack of access to basic resources such as adequate food, contributes to significant disparities. Furthermore, linguistic and cultural issues make communication between health professionals and indigenous communities difficult³⁰.

Added to this are the cultural peculiarities and ethnic differences of indigenous peoples with their customs and knowledge, especially with regard to childhood, with their rituals and symbols of this universe³¹.

A study carried out in New Zealand with 11 individuals, school directors and representatives of the district health council, among others, sought to identify the factors related to the increase in childhood obesity in indigenous Māori people. The results were the influence of social isolation caused by COVID-19 and the consequent exacerbation of low access to nutritious food, related to socioeconomic issues, such as poverty and high food prices²³.

Likewise, a study²⁶ with 27,292,879 individuals revealed that with COVID-19 the risk of developing type 1 DM increased, especially children aged 0-17 years, and among American Indians/Alaskan Natives. A survey³⁹ observed the growing number of cases of childhood obesity and cites globalization in addition to the restrictions imposed by the pandemic. The literature mentions that obesity is associated with a series of other long-term health problems, such as type 2 Diabetes *Mellitus*, cardiovascular diseases, high blood pressure and respiratory disorders⁴⁰.

Another implication found was in relation to prematurity related to COVID-19 infection. In a retrospective cohort study in the United

States²¹, which evaluated the predominance of COVID-19 diagnosis during pregnancy and the association of such infection with the occurrence of premature births in different racial and ethnic populations, it was found that contamination by COVID-19 increases the risk of premature births (<37 weeks) is 40% and the highest risk is in Native American/Alaskan Native women (28.6%).

This corroborates a multicenter cohort study, with 125 newborns of women infected with COVID-19, which showed rates of cesarean section, prematurity and low birth weight respectively of 71.2%, 26.4% and 12.8%⁴¹. Furthermore, the vulnerability of these children and the need for specific actions to protect their health during the pandemic, exposes the socioeconomic conditions and limited access to health services faced by many indigenous communities, related to their context, cultural, communication, and less availability of resources for protective practices³⁷⁻³⁸.

From this review, few studies were found to be carried out with this population on the aforementioned topic. The studies identified the need for specific actions to protect indigenous health during the pandemic, the vulnerabilities faced by indigenous children, considering socioeconomic conditions and limited access to health services and the context of the pandemic.

CONCLUSION

Scientific evidence showed that COVID-19 hit indigenous children hard, evidenced mainly by the higher number of hospitalizations and mortality in this group. Factors that contributed to this may be associated with difficulties in accessing healthcare and socioeconomic issues and vulnerabilities that emerged during the pandemic.

The vulnerability of indigenous peoples du-

ring the pandemic was considerably intensified, given not only the threat posed by the virus, but also inequalities related to cultural and socioeconomic issues that have historically been exerted on these peoples, and which still occur to this day. Therefore, thinking about the health of indigenous children is fundamental for the survival and resistance of the original peoples of Brazilian lands.

Therefore, indigenous children present greater risk factors for unfavorable clinical outcomes that must be considered during a health emergency such as the COVID-19 pandemic. In addition to several implications related to accessibility difficulties outside their territories in the face of vulnerable situations such as the pandemic. From this perspective, it is essential to plan specific health actions for this group in order to minimize future risks for this population. Furthermore, policies to protect indigenous peoples are necessary, for prevention and surveillance of their health, whilst preserving their culture and ethnic issues.

Finally, the scarcity of studies on the repercussions of COVID-19 on indigenous children highlights the urgency of more in-depth and inclusive investigations that consider the cultural, social and health realities of these vulnerable populations. The gap in specific data

and analysis on indigenous children during the pandemic may compromise the formulation of policies and interventions targeted at these communities, underlining the importance of filling this knowledge gap to ensure effective and equitable approaches to facing a health crisis. In view of this, this study may contribute to the construction of knowledge on the subject, given the gap identified, with incipient scientific production, about indigenous peoples, especially indigenous children.

The heterogeneity of the studies included and their interpretation in the light of this information is highlighted as a limitation. Therefore, it is necessary to carry out multi-center studies and qualitative research, comparing the vulnerabilities of indigenous children to other population groups, in order to understand their weaknesses and, based on this, provide care that responds to the needs of this population.

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