

The COVID-19 Pandemic and its Repercussions on Family Health-Related Behaviors: An Integrative Review*

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Theme: Health promotion, well-being, and quality of life

Contributions to the field: This integrative review allowed for the identification, in the scientific literature, of the main effects of the COVID-19 pandemic on family health behaviors. This study is essential since, as this is a recent event, it is necessary to map and understand the countless consequences that the pandemic has had on family dynamics and the extent to which this event can have lasting repercussions on healthy behaviors and the health of families in the long term, in addition to grounding the actions of nursing professionals for assertive and conscious decision-making in the post-pandemic period.

Abstract

Introduction: The COVID-19 pandemic scenario has changed people's routines and lives. It is therefore necessary to understand how this event has changed health-related behaviors, especially in the family setting. **Objective:** To identify the repercussions of COVID-19 on family health-related behaviors. **Materials and Methods:** This is an integrative review study based on the Dholand method and the Prisma Statement, which used the Lilacs, PubMed, Medline, and Scopus databases, applying the descriptors 'health-related behaviors,' 'family,' 'parents,' and 'COVID-19' in English, Portuguese, and Spanish. Primary studies in English, Portuguese, and Spanish that addressed the effects of the COVID-19 pandemic on family health-related behaviors were included. Duplicate articles, literature reviews, case reports, study protocols, and articles outside the time frame analyzed were excluded. The level of evidence pyramid was also used to assess the quality and impact of the selected studies. **Results:** A total of 17 articles were included, which revealed a reduction in physical activity, a higher intake of foods rich in fat and sugar, and an increase in sedentary time associated with increased screen time among parents and children. Vaccine hesitancy among parents and difficulty in accessing healthcare services were also evident. **Conclusion:** The promotion of measures conducted by primary healthcare professionals to encourage healthy habits and the adoption of preventive practices in family healthcare are necessary to better understand the effects of this event and thus be able to mitigate them.

Keywords (Source: DeCS)

Health-Related Behavior; family; parents; COVID-19; Nursing.

4 La pandemia de COVID-19 y sus repercusiones en los comportamientos sanitarios de las familias: una revisión integradora

* El estudio se realizó con el apoyo de la Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes), Brasil, con código de financiación 001.

Resumen

Introducción: la pandemia de covid-19 cambió las rutinas y la vida de las personas. Por lo tanto, es necesario comprender cómo este acontecimiento modificó los comportamientos en materia de salud, sobre todo en el contexto familiar. **Objetivo:** identificar las repercusiones de la covid-19 en los comportamientos de salud de las familias. **Materiales y método:** estudio de revisión integrativa basado en el método Dhollande y en The PRISMA Statement, utilizando las bases de datos Lilacs, PubMed, Medline y Scopus, tomando como referencia para la búsqueda los descriptores “comportamientos relacionados con la salud”, “familia”, “padres” y “covid-19” en inglés, portugués y español. Se incluyeron estudios primarios, en inglés, portugués y español, que abordaran los efectos de la pandemia de covid-19 en los comportamientos de salud de las familias. Se excluyeron artículos duplicados, revisiones bibliográficas, informes de casos, protocolos de estudio y artículos fuera del marco temporal analizado. También se utilizó la pirámide del nivel de evidencia para evaluar la calidad y el impacto de los estudios seleccionados. **Resultados:** se incluyeron 17 artículos que mostraban reducción de la actividad física, mayor ingesta de alimentos ricos en grasas y azúcares, aumento del sedentarismo asociado a un mayor consumo de pantallas entre padres e hijos. También se evidenciaron dudas sobre la vacunación entre los padres y dificultades para acceder a los servicios sanitarios. **Conclusión:** es necesario que los profesionales de salud de atención primaria promuevan hábitos saludables y adopten prácticas preventivas en la atención a la salud familiar para comprender mejor los efectos de este evento y así poder mitigarlos.

Palabras clave (fuente DeCS)

Comportamientos relacionados con la salud, familia, padres, covid-19, enfermería.

Pandemia da covid-19 e suas repercussões nos comportamentos de saúde das famílias: revisão integrativa

* O presente estudo foi realizado com apoio da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes), Brasil, com código de financiamento 001.

Resumo

Introdução: o cenário da pandemia da covid-19 alterou a rotina e a vida das pessoas. Por isso, faz-se necessário compreender como esse evento modificou os comportamentos de saúde, principalmente no contexto familiar. **Objetivo:** identificar as repercussões da covid-19 nos comportamentos de saúde das famílias. **Materiais e método:** estudo de revisão integrativa baseada no método de Dhollande e The Prisma Statement, que utilizou as bases de dados da Lilacs, PubMed, Medline e Scopus, tendo como referência para a busca os descritores “comportamentos relacionados com a saúde”, “família”, “pais” e “covid-19”, em inglês, português e espanhol. Foram incluídos estudos primários, em inglês, português e espanhol, que abordassem os efeitos da pandemia da covid-19 nos comportamentos de saúde das famílias. Excluíram-se artigos duplicados, artigos de revisão de literatura, relatos de caso, protocolos de estudos, artigos que saem do recorte de tempo analisado. Ainda, utilizou-se a pirâmide de nível de evidência para avaliar a qualidade e o impacto dos estudos selecionados. **Resultados:** foram incluídos 17 artigos que mostraram redução na atividade física, ingestão maior de alimentos ricos em gordura e açúcar, aumento do tempo de sedentarismo associado ao maior consumo de telas entre pais e filhos. Ficou evidente também a hesitação vacinal entre os pais e a dificuldade de acesso aos serviços de saúde. **Conclusão:** fazem-se necessárias a promoção de ações pelos profissionais de saúde da atenção primária para estimular hábitos saudáveis e a adoção de práticas preventivas no cuidado da saúde das famílias, a fim de compreender melhor os efeitos decorrentes desse evento e, assim, poder mitigá-los.

Palavras-chave (Fonte DeCS)

Comportamentos relacionados com a saúde, família, pais, covid-19, enfermagem.

Introduction

SARS-CoV-2 is a novel type of virus that was initially discovered in Wuhan province in December 2019, which is characterized by causing a severe acute respiratory syndrome that has been termed 'COVID-19.' In March 2020, according to the World Health Organization (WHO), COVID-19 was no longer classified as an outbreak, but instead as a pandemic, due to its high spread and transmissibility (1).

Healthcare services responded with measures to control and treat those who were affected, despite numerous challenges, including the absence or limitation of information on the most adequate healthcare procedures during the pandemic. However, it is worth noting that the consequences stemming from this period still have repercussions on people's daily lives and warrant awareness among healthcare professionals and the general population.

The lifestyle and routine changes caused by the pandemic have had an impact on the physical and emotional health of a large part of the population, in addition to changing their healthcare habits. In this regard, a cross-sectional study that assessed changes in the health-related behaviors of approximately 45,000 Brazilian adults during the pandemic showed a significant increase in behaviors that endanger health, especially a reduction in the practice of physical activity, an increase in screen time, a decrease in the intake of healthy foods, and an increase in the consumption of cigarettes and alcoholic beverages as a result of restrictions for the prevention of COVID-19 (2).

According to the WHO glossary on health promotion (3), the concept of health-related behaviors has been broadened and is defined as the activities that individuals engage in to protect, promote, and maintain their health, which can be influenced by a series of social, environmental, and psychological factors that lead to the promotion of the population's health. In this context, the change in the world scenario due to the COVID-19 pandemic, along with isolation measures and their repercussions, have proven to be important factors for adherence to healthy behaviors in several social groups (4).

According to Figueiredo (2015), health-related behaviors are the result of an individual's previous knowledge and conception of health, which motivates them to act in an effort to promote their physical and emotional well-being (5). It is worth noting that the avalanche of misinformation disseminated without any criteria or verification through digital media during the pandemic has compromised safe health promotion since false information has influenced the population's behaviors and actions, distancing them from scientifically proven care and placing their physical and emotional integrity at risk (6, 7).

A study conducted with approximately 16,000 Brazilian adults assessed the population's behavior during the social isolation period and found that approximately 56% of the participants stated that they had experienced a change in their sleep routine and 30% re-

ported sleeping less when compared to the period prior to the pandemic. In the same study, 60% stated that they did not engage in any type of physical activity (8).

In the family setting, the COVID-19 pandemic has also had significant impacts. Difficulties related to coexistence and interpersonal relationships have been highlighted, often due to a lack of communication, since several family members had never spent such an extended time together, a problem that has been exacerbated by the excessive use of technology, which has created a sense of isolation. It should be noted that changes in working methods, such as the implementation of home office work and the increase in household chores undertaken by a single family member, often assigned to the female figure, have led to an overload of tasks and an increase in stress and anxiety (9, 10).

Therefore, among the several family structures impacted by the pandemic, those consisting of parents and school-age children were the most affected due to the closure of daycare centers and schools, which forced children and adolescents to remain at home, creating challenges for the readjustment of family life and routine (11).

In light of this scenario, a qualitative study that assessed the impact of the COVID-19 pandemic on the family relationships of parents with children aged 7 to 9 in Brazil revealed the absence of a structured routine and challenges faced by parents in reconciling household chores with paid work, mainly due to the lack of school support and the restriction of contact with other support and family networks. Participants also reported difficulties in establishing an adequate routine due to increased screen time by children for school and leisure activities (12).

In light of the above, it is necessary to identify the changes in the health-related behaviors and habits of families caused by the abrupt transition in routine and lifestyles resulting from the COVID-19 pandemic, analyzing the repercussions on the health and family dynamics of adolescents and young parents of preschool children in the post-pandemic period (13).

Thus, the present article aims to present a study, through an integrative review, on the main repercussions of COVID-19 on health-related behaviors in the family setting, encompassing aspects of health that are related to sleep routine, diet, physical activity, and preventive behaviors. The aim is to understand the main consequences and provide a framework of knowledge for the creation of strategies to promote the health and well-being of these individuals.

Materials and Methods

This is an integrative review study, which aims to group and systematize the knowledge produced on a given theme in a synthe-

sized and analytical format, with the purpose of establishing conclusions and collecting evidence to generate solutions and provide support for possible future interventions that will help in nursing assistance and care (14, 15).

To ensure greater methodological rigor in the research, the proposal outlined by Dhollande (14) was used, which includes seven steps for constructing an integrative review: defining the theme and research question; determining the search strategy; critically evaluating the research; summarizing the results obtained; extracting and reducing the data; analyzing the results; conclusions and implications.

In light of the above, the guiding question of this study was: What are the repercussions of the COVID-19 pandemic on family health-related behaviors? To arrive at this research question, the PICoT strategy was used, where the letter 'P' stands for the population of interest, which, in this case, is represented by the family; the letter 'I' stands for the interventions/issues or areas of interest, which, in this study, are evidenced by the family health-related behaviors; "C" stands for the context in which the population is inserted, represented by the COVID-19 pandemic; "o" stands for the results obtained, that is, the repercussions of the pandemic on health-related behaviors; in addition, the letter 'T' stands for the time frame to be analyzed, characterized by the period ranging from 2020 to 2024 (14-17).

The search for articles was conducted via the following databases: Latin American and Caribbean Health Sciences (Lilacs), Online Medical Literature Search and Analysis System (Medline), PubMed, and Scopus, with the latter being accessed via the Federated Academic Community (Comunidade Acadêmica Federada - CAFE) on the website of the Coordination for the Improvement of Higher Education Personnel (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Capes) journal. The following controlled descriptors were used: (Medical Subject Headings – MeSH, and Descritores em Ciências da Saúde – DeCS): (*Comportamentos relacionados com a saúde*) AND (*Família OR Pais*) AND COVID-19; (Health-Related Behaviors) AND (Family OR Parents) AND COVID-19; and (*Conductas Relacionadas con la Salud*) AND (*Familia OR Padres*) AND COVID-19.

The eligibility criteria were based on the research question. Thus, after reading the titles and abstracts of the articles found in the databases, primary studies in Portuguese, English, and Spanish that addressed in their results the repercussions of the COVID-19 pandemic on family health-related behaviors (such as diet, sleep, physical activity, and the use of preventive measures for COVID-19) conducted between 2020 and 2024 were included. Duplicate articles, literature reviews, case reports, study protocols, and articles that were published before the timeframe set for inclusion and that were outside the research scope formulated in the research question were excluded.

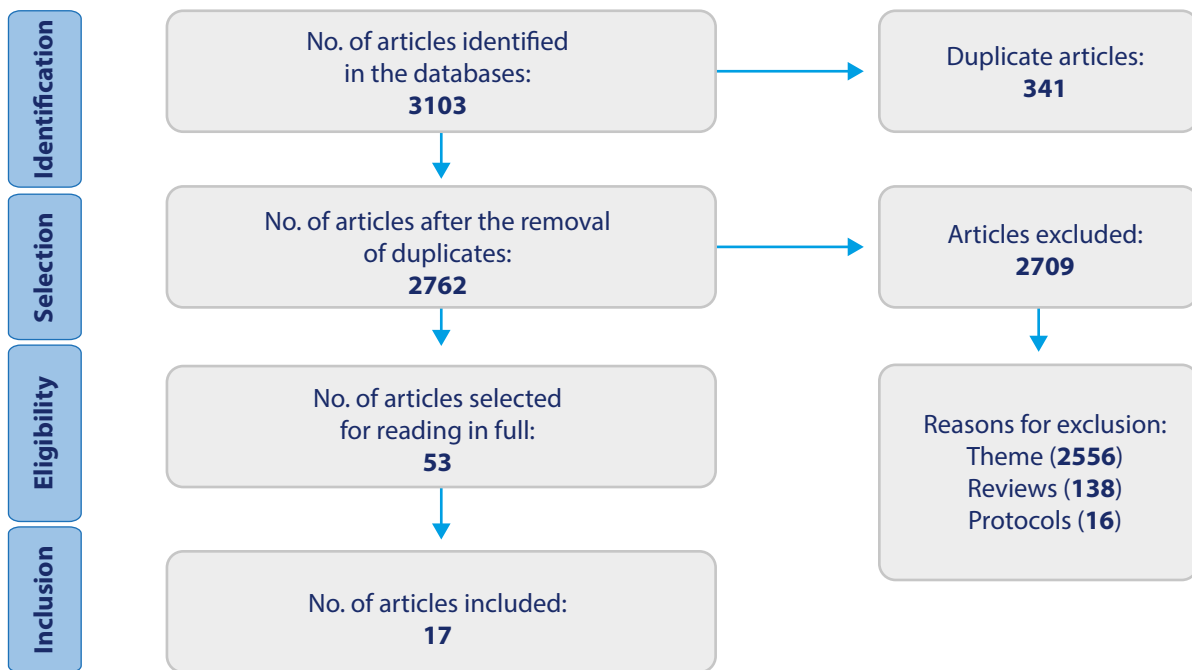
The search and selection of articles were conducted independently by two reviewers. The references and abstracts of the articles were exported to the Rayyan QCRI® selection program to facilitate the reviewers' evaluation and to remove all duplicate articles.

With the aim of understanding the impact and reliability of the results found in the articles, a pyramid-shaped hierarchical classification was used, in which the top contains articles with a study design and findings that are more scientifically rigorous in their construction. At the bottom are studies with smaller samples, which have a more restrictive method and limited impact (18).

Results

Based on the databases researched and the search strategies and descriptors mentioned above, 3103 articles were found, of which 27 were found on Lilacs (16 in Portuguese, 7 in Spanish, and 4 in English), 391 on Medline (37 in Portuguese, 18 in Spanish, and 337 in English), 2172 on PubMed, and 568 on Scopus. Of the 3103 articles, 341 were duplicates, with 2762 articles remaining for title and abstract reading. After considering the inclusion and exclusion criteria, 53 were selected for reading in full and 17 were included in the review to discuss their findings (Figure 1).

Figure 1. Flowchart of the database search following PRISMA guidelines



Source: Prepared by the authors.

Table 1 presents the articles selected for this study.

Table 1. Title, Authors, Objectives, and Results of the Articles Produced within the Timeframe

Title and Code	Author	Objectives	Results
COVID-19 and Parent Intention to Vaccinate Their Children Against Influenza (A1)	Sokol RL, Grummon AH (19)	To assess whether the Coronavirus Disease 2019 (COVID-19) pandemic influences parents' intentions to have their children vaccinated against seasonal influenza 2020-2021.	This study included 2164 parents with children aged 6 months to 5 years, who reported polarized intentions regarding the future seasonal flu vaccination of their children in response to the COVID-19 pandemic.

Title and Code	Author	Objectives	Results
Accelerometer-measured physical activity and sedentary time among children and their parents in the UK before and after COVID-19 lockdowns: A natural experiment (A2)	Salway R, Foster C, Vocht Frank, Tibbitts B, Collyson L, House D, Williams JG et al. (12)	To compare the accelerometer measurements of children aged 10 and 11 before the COVID-19 pandemic with their levels from 2020 to 2021 to determine whether there has been a change in the physical activity pattern of these children.	A study with 1,296 children aged 10 to 11 revealed that children's physical activity levels were lower than in the pre-COVID-19 period by approximately 7-8 minutes per day, both during the week and at weekends, when compared to data collected in the same schools, in the same format, before the COVID-19 pandemic. Parents' level of physical activity and mean sedentary time during wave 1 were similar to those of the pre-COVID-19 period.
The Impact of COVID-19 on Health Behavior, Stress, Financial and Food Security among Middle to High Income Canadian Families with Young Children (A3)	Carrol N, Sadowski A, Laila A, Hruska V, Nixon M, Ma DWL et al. (20)	To identify how health-related behaviors, stress levels, financial security, and food security have been impacted by the pandemic in Canadian families with young children.	A study with 254 families with children aged 18 months to 5 years showed that more than half of the families analyzed reported a change in diet during the pandemic (such as an increase in snack intake); increased screen time and decreased physical activity. Several families reported that sleep duration remained practically the same, although some parents reported a decrease in sleep duration. Parents reported moderately high levels of stress, related to financial instability, concerns regarding COVID-19 and changes in routine.
The impact of the COVID-19 pandemic on parents' behavior toward scheduled pediatric vaccinations in Saudi Arabia (A4)	Al-Nafeesah AS, Aldamigh AS, Almansoor BA, Al-Wutayd O, Al'Eed AA (21)	To determine the impact of the COVID-19 pandemic on parents' behavior regarding their children's scheduled vaccinations.	A study with 1143 parents of children aged 0 to 6 showed that, during the COVID-19 pandemic, the ratio of parents who delayed their children's scheduled vaccinations increased compared to that under normal conditions.
Food Insecurity, the Home Food Environment, and Parent Feeding Practices in the Era of COVID-19 (A5)	Adams EL, Caccavale LJ, Smith D, Bean MK (22)	To describe the changes in the household food environment of families and in the dietary practices of parents, from before the onset of the coronavirus disease 2019 (COVID-19) pandemic to during it.	A study with 584 parents and their children aged 5 to 18 revealed that approximately one-third of the parents in this study reported an increase in the intake of high-calorie snacks and desserts/sweets at home, while almost half reported an increase in the intake of non-perishable processed foods. In general, parents' concerns regarding overweight children have increased compared to the period before the onset of the COVID-19 pandemic.
Parental Perspectives on Immunizations: Impact of the COVID-19 Pandemic on Childhood Vaccine Hesitancy (A6)	He K, Mack WJ, Neely M, Lewis L, Anand V (23)	To determine whether the pandemic has impacted parents' perspectives on routine childhood vaccinations.	A study with 252 parents of children aged 0 to 18 showed a significant increase in parents' vaccine hesitancy scores, especially in the risk category, which evaluates parents' perception of the safety of vaccines and their side effects.
Parent Attitudes Towards Childhood Vaccines After the Onset of SARS-CoV-2 in the United States (A7)	Opel DJ, Furniss A, Zhou C, Rice JD, Spielvogel H, Spina C, Perreira C et al. (24)	To assess the effect of the SARS-CoV-2 pandemic before the availability of a vaccine against it on parents' general attitudes toward childhood vaccines.	A study with 4,562 parents of babies aged 0 to 2 months showed that parents were less likely to have negative attitudes towards adhering to the childhood immunization schedule immediately after the onset of the pandemic. However, this behavior changed throughout 2020, as parents began to hold a more negative perspective towards the vaccination of their children.
Parental help-seeking behavior for, and care of, a sick or injured child during the COVID-19 pandemic: A European online survey (A8)	Tan CD, Bressan S, Carter R, Hylén M, Kristensson I, Lakhanpaul M et al. (25)	To provide information on help-seeking behavior for, and care of, a sick or injured child, from the perspective of parents, during the COVID-19 pandemic in five European countries with different healthcare systems and changes in healthcare services due to COVID-19.	A study with 598 parents of children aged 0 to 18 from five different countries (Italy, Spain, Sweden, the Netherlands, and the United Kingdom) revealed that parents postponed seeking healthcare services for their children during the pandemic due to fear of being infected or of their children contracting the disease. Limited access to non-urgent healthcare services was also reported, whose impact was in delaying appointments, investigation, diagnosis, and treatment of illnesses. There was a slight decrease in demand for healthcare services in the UK, mainly due to the lockdown period.

Title and Code	Author	Objectives	Results
Short and medium-term effects of the COVID-19 lockdowns on child and parent accelerometer-measured physical activity and sedentary time: A natural experiment (A9)	Jago R, Salway R, House D, Walker R, Emm-Collison L, Sansum K et al. (26)	To assess the level of physical activity and sedentary time in 6th-grade children and their parents, measured during the first and second wave of COVID-19, compared to the pre-pandemic period.	A study with 1296 participating parents and children aged between 10 and 11 showed a reduction in physical activity time of 7 to 8 min/day during the week compared to the pre-COVID-19 period. In addition, sedentary time during the week remained higher than pre-COVID-19 at approximately 13 min/day. During wave 2, only 41% of children met the one-hour-per-day guideline for moderate physical activity, while almost 83% of parents met the physical activity guideline for adults.
Composition and Nutritional Quality of the Diet in Spanish Households during the First Wave of the COVID-19 Pandemic (A10)	Del Pozo SC, Alonso IL, Nuñez O, Castelló AP, Lope VC, Fernández NBL et al. (27)	To describe the diet and its nutritional quality during the first wave of the COVID-19 pandemic in Spain, using household food purchase data and comparing it with the same period in 2019.	A study with 12,500 families showed an increase in the purchase of all food groups, especially alcoholic beverages, snacks, eggs, sugar and sweets, vegetables and legumes. Regarding the distribution of macronutrients, sugars, alcohol, and fats, expressed as a percentage of energy, have not changed compared to 2019.
The Impact of COVID-19 Restrictions on the Healthy Eating and Movement Behaviors of 0-12-Year-Old Children in Western Sydney, Australia (A11)	McNicholas J, Hammersley ML, Hopkins S, McDermott S, Plaskett J (28)	To identify changes in child and family eating and movement behaviors (including physical activity, sedentary behavior, and sleep) in Western Sydney households with children aged 0-12 years during the peak of COVID-19 restrictions in 2020.	A study with 1371 parents and their children aged 0 to 12 showed an increase in family sedentary behaviors, children's screen time and social media use. Changes were also noticed concerning eating behaviors, with an increase in the intake of meals, snacks, and unhealthy foods. Some positive food-related changes included more home-cooked meals and families having more meals together. There was also an increase in the intake of healthy foods. There were changes in activity, with small general increases, but lower outdoor activity (except for backyard activity) and higher indoor activity.
Impact of COVID-19 on the sleep-wake patterns of preschool children (A12)	Wong OY, Au CT, Yuen HM, Yu KN, Lan QY, Chan NY et al. (29)	To explore the changes in sleep patterns, physical activity, and screen time of preschool children and their parents during the COVID-19 pandemic due to school lockdown in Hong Kong.	A study with 720 children and parents who participated in a preschool sleep education project when they were aged between 2 and 6 found an association between changes in the sleep-wake patterns of preschool children and their parents, with delayed bedtimes and waking times, and an increase in the duration of nocturnal sleep. The mean daily sleep duration, however, was reduced as a result of the decrease in nap duration. The increase in screen time was due to the replacement of time for naps and physical activity with the time spent using electronic devices. These findings were found for both weekdays and weekends.
Lockdown due to COVID-19 in Spanish Children Up to 6 Years: Consequences on Diet, Lifestyle, Screen Viewing, and Sleep (A13)	Díaz-Rodríguez M, Carretero-Bravo J, Pérez-Muñoz C, Deudero-Sánchez M (30)	To register how the habits of children under the age of 6 in the province of Cádiz, Spain, have changed during lockdown to identify those that may be a detriment to the problem of overweight and obesity.	A study with 789 families with children aged 0 to 6 revealed that, after lockdown, parents reported a considerable increase in their children's screen time. Regarding physical exercise, parents showed a considerable reduction in the hours of activity, with half an hour or less being the most frequent category, especially in children aged 3 to 6. Children's intake of unhealthy snacks and meals increased after lockdown. It was also found that the quality of parents' sleep was worse during lockdown. There was evidence of an increase in children's sleep hours, although this was not in line with what is recommended.
Child and Parent Physical Activity, Sleep, and Screen Time During COVID-19 and Associations with Mental Health: Implications for Future Psycho-Cardiological Disease? (A14)	Olive LS, Sciberras E, Berkowitz TS, Hoare E, Telford RM, O'Neil A et al. (31)	To research the levels of physical activity, screen time and sleep during the early stages of COVID-19 social restrictions in Australia and compare them with national pre-COVID-19 data.	A study with 2365 parents of children aged 0-18 showed that children and parents under lockdown restrictions reported substantially higher rates of sleep problems compared to pre-pandemic rates and also reported that their children had higher levels of leisure time spent in front of screens at weekends. Children who participated in lower levels of physical activity had higher levels of recreational screen time and had greater sleep problems.

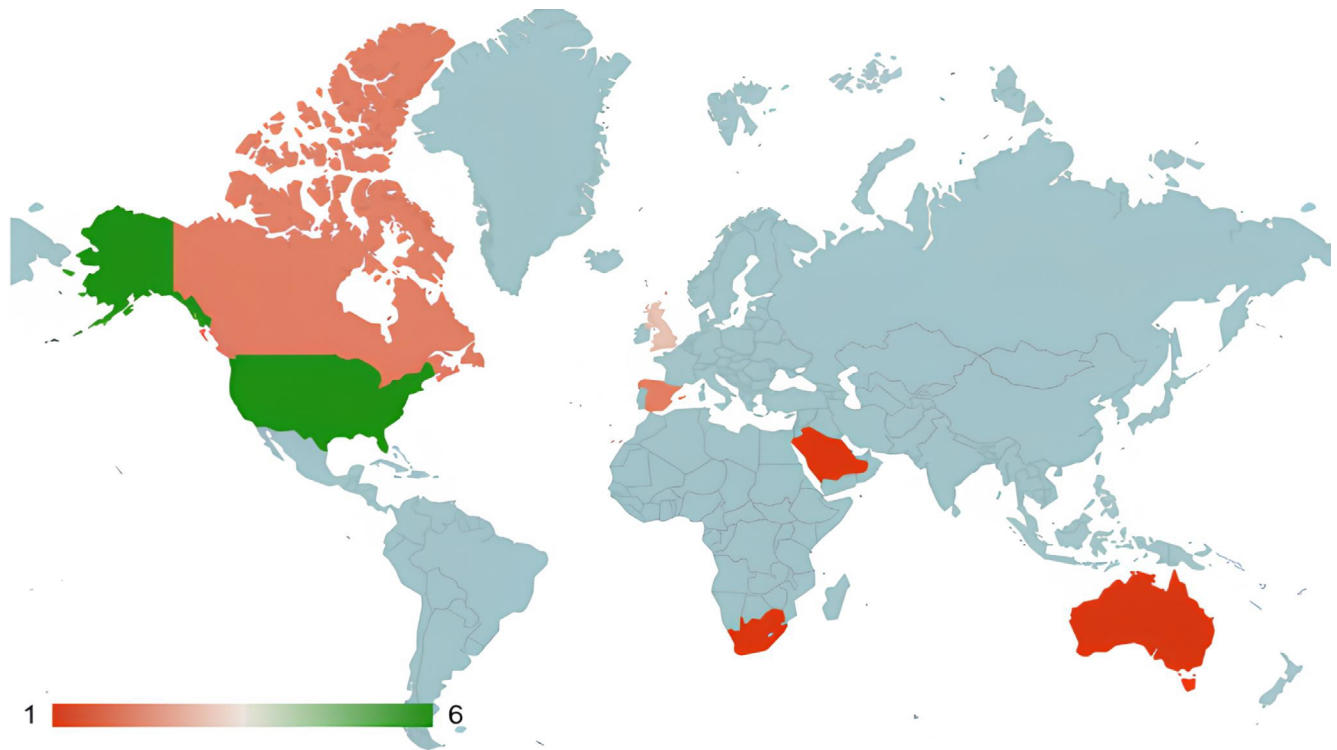
Title and Code	Author	Objectives	Results
How COVID-19 impacted child and family health and healthcare: A mixed-methods study incorporating family voices (A15)	Heerman WJ, Gross R, Lampkin J, Nmoh A, Eatwell S, Delamater AM et al. (32)	To describe how the social disruptions caused by the COVID-19 pandemic have impacted children's access to healthcare and childhood health-related behaviors in 2020.	A study with 900 parent-child dyads aged 0-5 years revealed that many participants described decreasing their use of healthcare systems due to fear of COVID-19. Participants reported mixed impacts from COVID-19 on eating habits, with most reporting improvement, and on physical activity, with most reporting worsening. Similarly, in the qualitative analysis, participants described some areas of improvement in nutrition, such as more exclusive breastfeeding and increased involvement in infant feeding, while describing that older children experienced less healthy eating habits and more screen time.
The impact of COVID-19 on routine child immunisation in South Africa (A16)	Moyo S, Ashok A, Myers L, Nyankieya R, Sharma S, Prasad R et al. (33)	To explore the impact of COVID-19 on the acceptance of routine childhood immunization services in South Africa.	A study with 51 parents and caregivers of children under the age of 5 in South Africa found that attendance at healthcare facilities during peak lockdown periods was low, with most caregivers avoiding public healthcare facilities for fear of potential exposure to COVID-19. Parents stated that they had no information from the media regarding the working hours of healthcare facilities during the pandemic and had the perception that the services were focused solely on COVID-19 care.
Confidence and barriers: Analysis of factors associated with timely routine childhood vaccination in Canada during the COVID-19 pandemic (A17)	MacKay H, Gretton JD, Chyderiotis S, Elliott S, Howarth A, Guo C et al. (34)	To examine the factors that influence timely vaccination during the pandemic.	A study with 2036 Canadian parents of children under the age of 18 showed that approximately 25% of parents reported having missed or delayed a routine vaccination appointment since the onset of the pandemic in March 2020, as well as reporting that their stances and conceptions towards vaccines had become more negative compared to the pre-pandemic period.

Source: Prepared by the authors.

Regarding the publication year, most studies were conducted in 2022 with six published articles (A2, A6, A7, A11, A12 and A15), representing 40% of the studies included in the review, while the years 2020 (A2, A3 and A5), 2021 (A4, A10 and A14), and 2023 (A8, A9, A12) had three published studies, respectively. Two studies conducted in the year 2024 were found (A16 and A17). All the studies included were available in English. There was a prevalence of cross-sectional studies, 59% in 10 articles (A1, A2, A4, A5, A6, A9, A10, A11, A14 and A17), followed by cohort studies, 20% in three articles (A3, A8, A12), three mixed studies (A11, A15 and A16), and one randomized clinical trial (A7). The vast majority of the articles found in the search were quantitative in nature. No qualitative studies were found within the inclusion criteria for this review. As for the level of evidence, 13 articles were classified as level V (A1, A2, A4, A5, A6, A9, A10, A11, A13, A14, A15, A16 and A17), three articles, representing 20%, were classified as level IV (A3, A8 and A12), and one article, representing 6.7%, was classified as level II (A7).

Regarding the country of origin, most studies (35%) were conducted in the United States (A1, A5, A6, A7, A15), followed by the United Kingdom, 17.6%, with three articles (A2, A8 and A9), Spain with two studies, 11.8%, (A10 and A13), Canada with two articles, 11.8% (A3 and A17), and Australia (A11), South Africa (A16), Saudi Arabia (A4), and Hong Kong (A12) with one published article each (5.9%). No Brazilian studies were found that met the inclusion criteria and addressed the research question (Figure 2).

Figure 2. World Map Displaying the Prevalence of Studies Regarding Their Country of Origin



Source: Prepared by the authors.

Six articles (59%) included children aged from 0 to 6 as the study sample (A1, A3, A4, A6, A8, A11, A12, A15, A16, and A17). In seven articles, the sample group consisted of children and adolescents aged from 10 to 18 (A2, A3, A5, A6, A8, A11, A14 and A17).

Regarding the object of study addressed in the articles, 7, representing 41.2%, discussed physical activity (A2, A3, A9, A13, A14 and A15); 6, representing 35.3%, evaluated diet (A3, A5, A10, A11, A13 and A15); 6, representing 35.3%, analyzed screen time (A3, A11, A12, A13, A4 and A15); 4, representing 23.5%, discussed changes in sleep patterns (A3, A12, A13 and A14); 6, representing 35.3%, addressed adherence and hesitancy to childhood vaccinations (A1, A4, A6, A7, A16 and A17), and only two articles, representing 11.8%, assessed parental access to healthcare services (A8 and A15).

Some changes in health-related behaviors resulting from the COVID-19 pandemic were evident. Articles A2, A3, A9, A13, A14, and A15 showed a reduction in physical activity time, especially in the frequency of children's physical activity. In terms of dietary patterns, articles A3, A5, A11, and A13 showed an increase in the intake of unhealthy foods, such as ultra-processed foods rich in sugar and fat, which had repercussions on the reduction in the nutritional quality found in households. Other studies (A3, A11, A12, A13, A14, and A15) reported an increase in screen time, especially among children, which is generally associated with a reduction in physical activity, as mentioned above, and changes in sleep patterns, a problem mentioned in articles A12, A13, and A14. Another effect of the pandemic was the growing hesitancy

to vaccinate, which hinders parents' adherence to the children's vaccination schedule, scenarios which were present in articles A1, A4, A6, A7, A16, and A17. In addition, studies A8 and A15 highlighted the barriers faced by parents when seeking healthcare services for their children (Table 2).

Table 2. Health-Related Behaviors Presented and Repercussions of the Pandemic

Articles	Access to Healthcare Services	Nutrition	Physical Activity	Vaccination Hesitancy	Screen Time	Sleep
A1				Varied		
A2			(-)* (=)**			
A3		(-)* (-)**	(-)* (-)**		(+)* (+)**	(=)* (=)**
A4				(+)*		
A5		(-)* (-)**				
A6				(+)*		
A7				(+)*		
A8	(-)* (-)**					
A9			(-)* (=)**			
A10		Varied				
A11		(-)* (-)**	(+)* (+)**		(+)* (=)**	
A12					(+)*	(-)* (-)**
A13		(-)* (-)**	(-)* (-)**		(+)*	(+)* (-)**
A14			(-)*		(+)*	(-)* (-)**
A15	(-)* (-)**	(+)* (+)**	(-)* (-)**		(+)*	
A16				(+)*		
A17				(+)*		

Key: (-) health-related behaviors that decreased or worsened; (+) health-related behaviors that increased or improved; (=) health-related behaviors that remained the same; *children's health-related behaviors; **parents' health-related behaviors.

Source: Prepared by the authors.

Results Analysis

Regarding the outcomes found in the studies, it can be noted that the COVID-19 pandemic has had significant repercussions on various aspects of family health. It was therefore possible to divide these effects into two broad categories: changes in prevention behaviors against COVID-19 and effects on health-related behaviors in general, such as physical activity, screen time, family eating patterns and sleep patterns.

General Health-Related Behavior

In this category, most of the articles found address the themes focusing on physical activity, nutrition, screen time, and changes in families' sleep patterns. Thus, the restrictive measures to control the

COVID-19 pandemic have drastically reduced the opportunities for physical activity, since social isolation, school lockdowns, and home office work have limited the options for leisure and mobility, given that most people exercise outside their homes (35, 36).

Therefore, studies have shown a considerable reduction in parents and children's physical activity time, which has repercussions on the increase in family sedentary time, which is often associated with an increase in screen time, as an alternative to the barriers to access leisure and the outdoors (12, 26, 30).

Regarding dietary patterns, studies have shown an increase in the intake of unhealthy meals by children, such as snacks and foods high in sugar and fat, which has led many parents to be concerned about the risk of obesity in their children (27, 28, 33, 37, 38). Linked to this issue, the increase in household tasks performed by parents during social isolation has led them to opt for the intake of ultra-processed foods as a practical and quick way of meeting their children's needs (39).

The changes in family sleep patterns were also evident, as many children showed changes in their bedtimes and waking times, and many parents reported a worsening in the quality of their sleep (40, 41). As a result, in an attempt to adjust their routine to the new reality of school lockdowns, many families made bedtimes and waking times more flexible, which may have led to changes in children's sleep patterns, impairing their memory and learning (42).

This problem is often associated with the significant increase in screen time in the household routine (43-46). Increased use of electronic devices replaces time for physical activity and alters children's sleep windows, leading them to stay awake longer and altering their sleeping and waking patterns (30, 31, 41). A study conducted with 321 Brazilian parents showed that 85% of caregivers reported an increase in screen time compared to the period before the pandemic. In addition, the same study showed that this increased screen time may be associated with its use for educational purposes, mainly related to school-age children, as well as the reallocation of leisure time to the digital environment (47).

Health-Related Behaviors Focused on the Prevention of COVID-19 and Other Diseases

Within this category are six articles from the sample whose results included aspects involving vaccine hesitancy, changes in parents' perceptions and adherence to the childhood vaccination schedule, as well as aspects that influence adherence to vaccination against COVID-19 by parents and children. Also included are articles that reveal changes that the COVID-19 pandemic has caused in the demand for healthcare services and access to services for appointments, diagnosis, and treatment of diseases.

In this sense, vaccine hesitancy is a behavioral phenomenon influenced by various aspects such as cultural, economic, psychosocial, and political, determined by three main factors: lack of confidence in the efficacy or fear of side effects, absence or a limited sense of risk of contracting diseases, and limited access to immunizers (48). In this context, parents have become noticeably more hesitant to vaccinate their children, both in terms of the vaccination schedule and in terms of adherence to the COVID-19 vaccine for children, mainly due to their fear of the risk of adverse effects and reactions of the immunizers on their children's health (19, 23, 24). Another study, conducted in Saudi Arabia, showed a reduction in adherence and delays in vaccinating children compared to the period prior to the pandemic, especially in places where there was a higher prevalence of COVID-19 cases (21).

Another factor that may have influenced vaccine hesitancy was the dissemination of fake news regarding the efficacy of vaccines and other effects they could cause (49, 50). Faced with this issue, a qualitative descriptive study conducted with 20 nurses in Brazil showed that, according to the professionals, the dissemination of fake news strongly influences the population's perception of and adherence to the immunization schedule, as it reduces trust in immunizers and the professionals who administer them. This behavior can be reinforced mainly due to the negationism of public figures and official government bodies via the media (41, 46, 50, 51).

The vaccine hesitancy found in these studies may be one of the factors responsible for the current low adherence to the vaccination schedule among children in Brazil (52-54). A historical series showing vaccination coverage for measles, diphtheria-tetanus-pertussis, and polio revealed a reduction in vaccination adherence associated with an increase in the number of cases of these diseases from 2014 onwards. The same study shows that the main causes of low adherence are a low perception of the risk posed by the disease, possible adverse events, and questions regarding the efficacy and formulation of the immunizers (55, 56).

Another problem stemming from the pandemic setting is the reduction in the supply of healthcare services, which has greatly restricted access to appointments, treatments, and elective procedures, given that most facilities and resources have been allocated to COVID-19 cases (56). From this perspective, a multicenter study conducted with 598 parents from five countries showed a reduction in the demand for healthcare services for their children since they reported difficulties in accessing non-urgent services, which leads to delays in appointments, investigation, diagnosis, treatment, and adequate management of diseases (25). In addition, there was another factor identified as a cause for reduced access to healthcare, as two of the included studies found a reduction in the demand for care for children primarily due to parents' fear of being infected by the virus or of their children contracting the disease (20, 32, 57).

Recommendations from the Studies Included

In light of the aforementioned effects of the COVID-19 pandemic, the present study aimed to group together the main suggestions and measures for support and management of the repercussions, as outlined by the authors. Thus, health-related habits should not be analyzed in isolation, given that many of the behaviors presented are interlinked, such as the association between reduced physical activity, increased screen time and changes in the sleep routine between parents and children. In this context, guidance and resources should be provided to help parents manage their children's screen time and physical activity, as well as recognize the structural challenges that lead to this behavior to find a balance between screen time and physical activity (20, 29).

It is worth highlighting the importance of schools in the promotion of physical activity during childhood, as the school environment creates more opportunities to promote more movement and leisure activities among children (26). As far as nursing professionals are concerned, health education is a powerful tool for guiding parents and caregivers on how to establish an adequate sleep hygiene routine, suited to the reality of each family (29, 30).

Regarding eating habits, the studies show the importance of implementing public policies that provide access to healthy meals for families with food insecurity. It also highlights the importance of the primary healthcare team in addressing programs and strategies that support the needs of children with obesity, caused by weight gain during the pandemic, as well as providing guidance to prevent complications from this scenario. It is necessary to ensure continued monitoring of diet quality in the post-pandemic period, especially through the varying epidemic waves and lockdown scenarios to quickly detect possible harmful dietary changes and establish adequate preventive measures (22, 27, 33).

Finally, the literature shows that, faced with crisis scenarios such as the one presented during the pandemic, the government as well as national and international organizations must create support measures to ensure safe access to healthcare services, such as adherence to childhood immunizations (19, 33). Thus, plans are needed to optimize the reserve stock to anticipate possible shortages. In addition, public-private partnerships should be contemplated to mitigate the impacts of these shortages. It is also recommended to reinforce reliable information through the media to improve the confidence of families and society in the importance of routine vaccination (24, 33, 34, 49).

Conclusions and Implications

This study compiled the main findings in the scientific literature on the repercussions of the COVID-19 pandemic on fami-

ly health-related behaviors. By evaluating the articles found, it was possible to better understand how the pandemic context has affected people's routines, altering social, economic, cultural, and political aspects that influence health promotion, prevention, and protection measures.

It was clear that, in addition to the transmission and problems caused by COVID-19, the measures to contain the disease were the main causes of changes in family behavior, with repercussions on physical activity, diet, sleep patterns, and the use of electronic devices by both parents and their children.

It is worth noting that the scenario of fear and uncertainty stemming from the pandemic has heightened the population's distrust towards the safety and efficacy of immunizers, a fact evidenced by the increase in vaccine hesitancy and the difficulty in adhering to the childhood vaccination schedule.

Although it is possible to find countless studies that address the effects of the COVID-19 pandemic on health-related behaviors, most do not include families as their study population, especially in the Brazilian scientific scenario, where studies are even scarcer.

From the implications of this study, the articles indicate compliance with the social practices of healthcare professionals, especially nurses, in primary healthcare. It is understood that the efforts should be directed towards family educational measures to encourage healthy habits and the adoption of preventive healthcare practices, with the improvement of intra-family relationships.

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