

A Systematic Review of the Impact of COVID-19 on Children's Outcomes

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ABSTRACT

Background: The COVID-19 pandemic has had an impact on the health of children. Nurses and healthcare professionals should know the latest information regarding the impact of Covid-19 on children. **Objective:** This literature review aims to identify the impact of COVID-19 on children's outcomes. **Method:** This literature study uses the narrative review method. CINAHL, PubMed, Proquest, Science Direct, and Google Scholar were used to conduct the literature search. The keywords used are "Children" AND "Coronavirus Disease 2019" OR "COVID-19" AND "Impact" OR "Effect". The articles used were subjected to critical assessment. Seven quantitative research articles were reviewed in this literature study. **Results:** This study shows that the COVID-19 pandemic has impacted children's health and education. In terms of health, COVID-19 causes changes in physical activity to more sedentary behavior, delayed immunization, a negative impact on the mental health of children and adolescents, and children with special needs health. In the education aspect, COVID-19 has brought about a transformation in the field. **Conclusion:** The ongoing COVID-19 pandemic makes assessing the short- and long-term effects on children difficult. The need to conduct further research will benefit nurses and healthcare professionals in providing appropriate nursing services to children and families.

Keyword: Children, coronavirus disease-2019 (COVID-19), effect, impact

INTRODUCTION

Severe Acute Respiratory Syndrome-Corona Virus-2 (SARS-CoV-2) appeared in Wuhan on December 31, 2019. The World Health Organization (WHO) (2020) refers to the disease caused by SARS-CoV-2 as Coronavirus Disease-2019 (COVID-19). World Health Organization data show that the number of cases outside China has increased 13-fold, and the number of affected countries has tripled in the two weeks since COVID-19 was discovered. On March 11, 2020, there were more than 118,000 cases in 114 countries, and 4,291 people died as a result of the Covid-19 disease outbreak. WHO has been monitoring the outbreak around the clock and is deeply concerned by the alarming rate of spread. The World Health Organization stated that Covid-19 could be classified as a

pandemic (World Health Organization, 2020).

Global political, financial, and technical resources have been mobilized to combat the COVID-19 pandemic (Khetrapal & Bhatia, 2020). The pandemic's impact is affecting all aspects of human life and slowing all developmental activities, including the achievement of the Sustainable Development Goals (SDGs), particularly the third (ensuring healthy lives and promoting well-being for all ages) and fourth (quality education) goals. Overcrowding in hospitals and health facilities due to COVID-19 makes it difficult for other patients with acute or chronic illnesses to receive standard care (Habibi & Pratama, 2021). In addition to combating the COVID-19 pandemic, national authorities must plan for challenges related to the health of their

population. Priority should be given to critical areas that address the needs of vulnerable groups, including children and others with special needs (Khetrapal & Bhatia, 2020). Public health activities are equally important in protecting communities' health, keeping them engaged in disease prevention, and leading healthy and productive lives. Any sudden disruption in the seamless delivery of health services, whether caused by man or natural disaster, has the potential to impact the majority of essential services severely. The COVID-19 pandemic has significantly impacted ongoing health programs, curative services, and SDG 3 achievement (Khetrapal & Bhatia, 2020).

The COVID-19 pandemic has had an impact on the health of children. Beginning with limiting patient admissions to hospitals and general health services unrelated to the COVID-19 emergency, becoming a part of the pandemic management strategy will have additional pandemic consequences on children who require routine care (Pasca *et al.*, 2020). According to the findings of a study conducted by Papadopoulos and Custovic (2020), pediatric asthma clinics are one of the healthcare services that the COVID-19 pandemic has significantly impacted. Other consequences include limiting the number of new patients and the number of patients monitored. Furthermore, the strategy of closing schools to prevent the spread means that children with disabilities, particularly cerebral palsy, do not have access to school or therapy (Ashikkali, Carroll, & Johnson, 2020).

According to Liu *et al.* (2020), the COVID-19 pandemic had a psychological impact on children subjected to quarantine at home to slow the spread of COVID-19. Children quarantined at home with their parents will experience stress due to the abrupt change in activity, but it will likely pass more quickly. Children who have been separated from their parents because they have been infected or are suspected of being infected with COVID-19 are quarantined in local hospitals, and children who have parents who are unable to work or who still have to work outside the home require special care. These children may be more vulnerable to mental health problems due to an increased risk of infection, as well as sadness and fear caused by the loss or separation of a parent. According to Go *et*

al. (2020), as the pandemic continues, it is critical to support children in dealing with the grief of separation and the problems associated with parents not working or loss of household income.

The COVID-19 pandemic has also impacted achieving SDG 4, which is quality education, particularly for children. Education is a critical foundation for achieving the other SDGs. Achieving the seventeen SDG goals without adequate knowledge and expertise is difficult (Lekagul *et al.*, 2022). According to SDG 2030, there are seven targets to achieve to ensure inclusive, equal-quality education that supports lifelong learning opportunities for all (International Council of Nurses, 2017). Unfortunately, the COVID-19 pandemic emerged in 2020, posing a significant challenge to the government's ability to meet its targets. COVID-19 has an impact on the global closure of children's schools.

According to data from the United Nations Educational, Scientific, and Cultural Organization (UNESCO), 130 countries closed schools in 2021, either nationally, regionally, or locally, as part of policies to slow the spread of COVID-19 (United Nations Educational, Scientific and Cultural Organization, 2021). Although the current school closure differs from school holidays, learning continues digitally. School closures are likely to exacerbate learning gaps for children from low-income families who cannot afford computers and cell phones with reliable internet connections.

Meanwhile, children from wealthy families may be able to continue their education without interruption. Aside from that, children may face psychological stress because they are unable to interact directly with their classmates at school. As a result, if nothing is done, the current health crisis may escalate into a social crisis with long-term consequences for children (Van Lancker & Parolin, 2020). According to research conducted by Lu *et al.* (2020), research must continue to discover other impacts experienced by children to provide evidence-based care for children.

Public health activities are an equally important arm of the health system in protecting the health of communities and keeping them engaged in preventing diseases and leading healthy

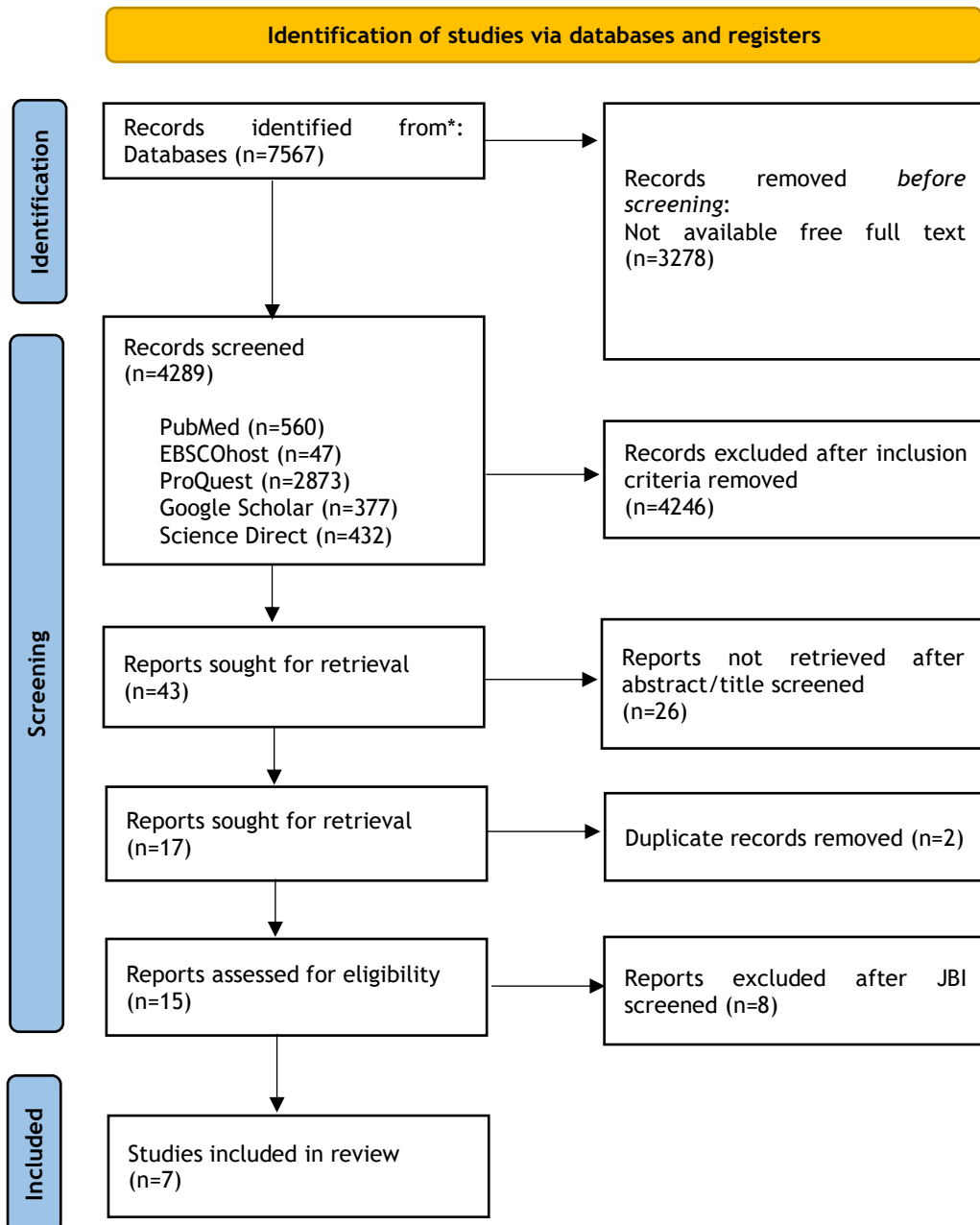
and productive lives (American Public Health Association, 2013). Any sudden man-made or natural disaster-induced disruption in the seamless delivery of health services has the potential to impact most essential services severely. The COVID-19 pandemic has severely impacted the ongoing health programs, curative services, children's education, and achievements of SDG 3 and SDG 4. Nursing can also contribute to SDG research and policies, strengthening its position as an active voice and developing a prominent role in achieving the goals (Edmonds *et al.*, 2020).

Nurses and the Nursing profession have opportunities to contribute more meaningfully to the SDGs (Costa *et al.*, 2023). Public health nurses who work with individuals and families do so in the context of a population focus—applying a systems perspective to factors that impact health, such as preventing the negative impact of pandemic conditions in achieving SDGs 3 and 4, particularly among children. Nurses can provide appropriate nursing care to children in pandemic situations. Nurses can work with other health professionals to promote adequate support systems for children and families during the pandemic (Peck, 2020). This systematic review aimed to identify the impact of COVID-19 on children's outcomes. This systematic review will benefit the field by providing evidence for the effect of the COVID-19 pandemic on children's health, allowing

nurses and health workers to mitigate and provide appropriate interventions for children and families.

METHODS

This literature review employed the narrative review method. This study followed Gopalakrishnan and Ganeshkumar's (2013) steps: identifying research questions, reviewing the literature, sifting studies to select relevant ones, assessing the quality of investigations, identifying outcome measures for each, and summarizing and reporting results. The literature search used several databases, including CINAHL, PubMed, Proquest, Science Direct, and Google Scholar. The keywords used are ("Children") AND ("Coronavirus Disease 2019" OR "COVID-19") AND ("Impact" OR "Effect"). The inclusion criteria were that the article discussed the impact of COVID-19 on children, that it was published within the last three years (2019-2022), that the participants were children aged 0-18 years, that it was written in Indonesian and English, and that the full text was available. Meanwhile, books, news, encyclopedias, and review articles that do not meet the inclusion criteria are excluded from this literature study. The articles that were used were assessed critically. This literature review found seven articles that met the criteria. Scheme 1 depicts the stages of the literature search.



Scheme 1. Stage of Narrative Review

RESULTS

The search gathered a total of 7567 articles. After filtering the article's availability, 4289 articles remained. Furthermore, after screening for title,

abstract, and duplicate, 15 articles remained. The remaining articles were evaluated using the JBI Critical Appraisal Tool, and seven articles were included in this study after assessing the whole article.

Table 1. The primary feature of the included studies

Author, Years	Country	Aim	Study Design	Sample Characteristic	Intervention	Outcomes	Tools	Measurement time	Results
(Alsuhaibani & Alaqeel, 2020)	Saudi Arabia	This study aimed to identify the prevalence of delayed immunization during the COVID-19 pandemic in the Qassim region of Saudi Arabia.	Cross-sectional Study	Parents who had a child under two years old from March 1 to June 30, 2020 (n = 749)	Participants were asked to complete a questionnaire and recorded on a 5-point Likert Scale from "strongly disagree" to "strongly agree."	Prevalence and reasons for delays in childhood vaccination	Self-administered questionnaire	- May 1 - June 30, 2020 - Two steps validation	About 73.2% of participants had an appointment scheduled for vaccination during the COVID-19 pandemic, and 23.4% reported a delay of more than one month. The most common reason for delayed vaccination was fear of being infected by COVID-19 (60.9%). In conclusion, COVID-19 affected childhood immunization in Saudi Arabia.
(Colizzi et al., 2020)	Italy	To investigate the impact of the COVID-19 pandemic on ASD individuals and to narrative characterize their needs.	Online Parent Survey	Parents and guardians of individuals with ASD diagnosis (n = 527)	Parents and guardians of individuals with an ASD diagnosis were asked by healthcare professionals affiliated with Veneto Autism Spectrum Disorder Regional Centre to fill out an online survey	Psychosocial and behavioral impact of the emergency outbreak, predictors of emergency outbreak negative impact on well-being, and needs to deal with the emergency	Self-administered questionnaire	April 6 - April 20, 2020	The COVID-19 emergency resulted in a challenging period for 93.9% of families, increased difficulties in managing daily activities, especially free time (78.1%) and structured activities (75.7%), and, respectively, 35.5% and 41.5% of children presenting with more intense and more frequent behavior problems. Behavior problems predating the COVID-19 outbreak predicted a higher risk of more intense (odds ratio (OR) = 2.16, 95% confidence interval (CI) 1.42-3.29) and more frequent (OR = 1.67, 95% CI 1.13-2.48) disruptive behavior. Even though ASD children were receiving different types of support, also requiring specialist (19.1%) or emergency (1.5%) interventions in a relatively low proportion of cases, several needs emerged, including receiving more healthcare support (47.4%),

Author, Years	Country	Aim	Study Design	Sample Characteristic	Intervention	Outcomes	Tools	Measurement time	Results
(Kagadkar <i>et al.</i> , 2020)	Bangladesh	To explore the impact of COVID-19 on the mental health during lockdown in Bangladesh	Cross-sectional Study	Parents having children aged 5 to 15 years in Bangladesh after completing 30 days of lockdown (n = 384)	The data was collected using an online questionnaire; a Google form link was sent to parents.	Mental health-related information of the child.	Revised Child Anxiety and Depression Scale (RCADS) and Generalized Anxiety Disorder (GAD)	April 25 to May 9, 2020	especially in-home support (29.9%), as well as interventions to tackle a potentially disruptive quarantine (16.8%) Children were classified into four groups where 43% of the children had subthreshold mental disturbances (mean Major Depressive Disorder (MDD)-10; 2.8), 30.5% had mild (mean MDD-10; 8.9), 19.3% suffered greatly (mean MDD-10; 15.9), and 7.2% of child suffered from severe disturbances (mean MDD-10; 25.2). The higher percentage of mental health disturbances in children with a higher education level of parents, relatives infected by COVID-19 (yes), parents still need to go to the workplace (yes), and parents with abnormal behavior but lower than their counterparts.
(Duan <i>et al.</i> , 2020b)	China	To demonstrate the psychological effects on children and adolescents associated with the epidemic.	Cross-sectional Study	Children aged 7 to 18 years (n = 3613)	Questionnaire Star was used with the help of the education bureau to distribute the questionnaire to teachers.	Psychological aspects of children and adolescents	- Questionnaire Star website - Spence Child Anxiety Scale (SCAS) - The Child Depression Inventory - Short Version of	April 25 - May 16, 2020: The survey was conducted twice within 6 - 12 months, with 20 minutes each session.	The anxiety levels of children and adolescents were (23.87 ± 15.79) and (29.27 ± 19.79), respectively. 22.28% of respondents were suffering from depressive symptoms. Seven significant factors are associated with increased levels of anxiety, including females, residents in urban regions, and emotion-focused coping styles. Nine factors related to increased levels of depression, such as smartphone addiction (OR 1.411, 95% CI 1.099-1.180), Internet addiction (OR 1.844, 95% CI 1.209-2.811), and

Author, Years	Country	Aim	Study Design	Sample Characteristic	Intervention	Outcomes	Tools	Measurement time	Results
							Smartphone Addiction Scale (SV-SAS) - Internet Addiction Scale - Coping Style Scale		residence in Hubei province (OR 3.107, 95% CI 1.252-7.708). Two additional factors associated with decreased levels of depressive symptoms: hours spent on the Internet per day before the epidemic (OR 0.652, 95% CI 0.609-0.697) and a tendency to apply problem-focused coping style (OR 0.937, 95% CI 0.923-0.951).
(Dunton <i>et al.</i> , 2020)	United States of America	To examine the effects of the COVID-19 pandemic on physical activity and sedentary behavior in children.	Prospective Survey Design	18 years old or older, able to speak English, live in the USA, is a parent or legal guardian of a child between the ages 5-13, greater than or equal to 50% of the child's custody resides with the parent or legal guardian, and planned parental custody for the next 12 months	Parents completed a measure of their child's previous day. Physical activity was created to capture non-school-based activities frequently occurring during COVID-19, modeled upon the structure and format of last-day physical activity measures used in youth.	Physical Activity and sedentary behavior in children	The Youth Compendium of Physical Activities	Once (after questionnaire)	From parent reports, children (N = 211) (53% female, 13% Hispanic, Mage = 8.73 [SD = 2.58] years) represented 35 states and the District of Columbia. The most common physical activities during the early COVID-19 period were free play/unstructured activity (e.g., running around, tag) (90% of children) and going for a walk (55% of children). Children engaged in about 90 minutes of school-related sitting and over 8 hours of leisure-related sitting daily. Parents of older children (ages 9-13) vs. younger children (ages 5-8) perceived more significant decreases in physical activity and greater increases in sedentary behavior from the pre- to early-COVID-19.
(Moore <i>et al.</i> , 2020)	Canada	To examine the immediate	Cross-sectional	Canadian parents of children aged 5-11 years old and	The participants were asked to	Health behavior in children and	Online questionnaire	Twice (before and after)	Only 4.8% (2.8% girls, 6.5% boys) of children and 0.6% (0.8% girls, 0.5% boys) of youth met combined

Author, Years	Country	Aim	Study Design	Sample Characteristic	Intervention	Outcomes	Tools	Measurement time	Results
		impact of the COVID-19 pandemic on movement and play behavior in children and youth.	Study	youth aged 12-17 years old (n = 1472)	compare their child's behavior before and during the COVID-19 outbreak.	youth		survey)	movement behavior guidelines during COVID-19 restrictions. Children and youth had lower physical activity levels, less outside time, higher sedentary behavior (including leisure screen time), and more sleep during the outbreak. Parental encouragement and support, parental engagement in PA, and family dog ownership were positively associated with healthy movement behaviors.
(Zhao <i>et al.</i> , 2020)	China	To assess the effects of COVID-19 and prepare for an educational approach.	Not mentioned	Teacher, parents, and students of grades 1-9 (n = 2010)	The survey about home-schooling-related questions was delivered separately to students, teachers, and parents.	Interest, interaction in class, feelings, physical discomfort, screen time, outdoor activity time, sleeping time, and schooling time preference	Online questionnaire	7 - 13 March 2020	We found that 76% of the respondents thought the homeschooling style was acceptable. However, teachers were concerned that students' interests, focus, and academic performance would decline. Sixty-nine percent of the parents reported their children had more than 3 hours of daily screen time, and 82% of students had less than 2 hours of daily outdoor activity. Ninety-five percent of the parents were concerned about their children's eyesight. Additionally, 17.6% of the students were suspected to have emotional or behavioral problems according to the parent-rated Strengths and Difficulties Questionnaire (SDQ) results. The Self-Rating Anxiety Scale (SAS) results of parents and teachers showed higher levels of anxiety than usual.

Characteristics of Studies

According to Table 1, most studies were conducted in Asia and America. There are four studies from Asia, including China (two), Bangladesh (one), and Saudi Arabia (one). America is represented by two articles: one from the United States and one from Canada. Meanwhile, one article from Europe, specifically Italy, is available. This study divided participants into three groups: parents, children, and teachers. All seven articles involve parents or guardians as participants, three include children, and one involves teachers. The participants' ages ranged from 7 to 40 years. The number of participants in the study ranged between 384 and 3613, with the article written by Kagadkar *et al.* (2020) having the fewest participants and the article written by Duan *et al.* (2020) having the most. Table 1 shows the characteristics of the included studies.

Impact for children

The impact of the COVID-19 pandemic has been discussed in 7 studies. The included studies consist of 5 cross-sectional studies (Moore *et al.*, 2020; Alsuhaibani and Alaqeel, 2020; Duan *et al.*, 2020; Yeasmin *et al.*, 2020; Zhao *et al.*, 2020); one prospective study (Dunton, Do, & Wang, 2020) and one survey study (Colizzi *et al.*, 2020). COVID-19 has a broad impact on children, including aspects of health and education. Table 1 shows that the impact of COVID-19 on children includes the impact of COVID-19 on their health and education.

DISCUSSION

The Impact of COVID-19 on Children's Health

Physical Activity and Sedentary Behavior

Moore *et al.* (2020) discovered that children and adolescents became less active after the COVID-19 pandemic, playing outside less frequently, engaging in more sedentary activities, engaging in more recreational screen-based activities, and sleeping more during the initial Covid virus pandemic compared to before the pandemic. Adolescents (12-17 years) are less active than children (5-11 years), and girls are less active than boys. According to research conducted in the United States by Dunton, Do, and Wang (2020), younger children (aged 5-8) are more

likely to engage in free play/activities. Children spent the most time watching television/videos/films, sitting while directly gathering with friends or family, doing school-related work, and playing computer or video games at the start of COVID-19. Surprisingly, on assessment days (weekdays and weekends combined), school-related sedentary time, which includes school-related video calls and doing school-related work, accounted for only about 90 minutes. Sitting for leisure activities, on the other hand, accounted for more than 8 hours of sitting time on the assessment day (Dunton, Do & Wang, 2020).

Overall, the two studies show that during the early period of COVID-19, children spent their unstructured free time doing sedentary rather than physical activity. During the COVID-19 pandemic, sedentary behavior may worsen, putting children at greater risk of health problems due to less physical activity and unhealthy weight gain due to school closures. According to Storz (2020), childhood obesity can be caused by sedentary or passive behavior, increased screen time, poor eating patterns, and irregular sleep.

Immunization

According to Alsuhaibani and Alaqeel (2020), the COVID-19 pandemic has impacted the timeliness of child immunization in Saudi Arabia's Qassim region. A two-week delay in vaccination was reported by 47.8% of parents. Significant delays of more than one month occurred in 23.4% of cases. However, 52.2% of parents said that scheduled vaccines were administered on time or within two weeks of the due date, and 73% of parents are aware of the Department of Health's immunization recommendations. Fear of contracting COVID-19 was cited as the primary reason for parents postponing vaccination, followed by time constraints (11.6%) and scheduling difficulties (9.2%). Other reasons given by parents included vaccination season travel, vaccine shortages, or clinic closures (6.7%). Because they were afraid of contracting COVID-19, 36.6% of parents preferred to vaccinate their children at home, 35.1% in primary healthcare facilities dedicated solely to vaccination, and only 17.8% said they would continue to receive future vaccinations (Alsuhaibani & Alaqeel 2020).

Mental Health

The government has implemented disease control measures such as school closures, social distancing, and home quarantine in response to the COVID-19 pandemic. Children and adolescents are physically isolated from peers, teachers, extended family, and community networks for extended periods, which may have an impact on their mental health (Loades *et al.*, 2020). Yeasmin *et al.* (2020) conducted a study in Bangladesh to examine the impact of mental health on children's depression, anxiety, and sleep disorder scores, which are divided into four categories (sub-threshold disorders, mild, moderate, and severe disorders). According to the study's findings, the majority of children's mental health disorders, 43%, are below the threshold. It should be noted, however, that 30.5% of children had mild disorders, 19.3% had moderate disorders, and 7.2% had severe disorders.

Yeasmin *et al.* (2020) discovered that the higher the parents' education, the number of parents who still work, and the risk of losing their jobs, the higher the scores for children's depression, anxiety, and sleep disorders. Even during the Bangladesh lockdown, educated parents, particularly government officials, are hard at work. As a result, parents cannot schedule time to communicate with their children based on their specific needs. Children who live in cities are also more likely to suffer from mental health issues than children who live in rural areas. According to Anwar *et al.* (2020), this could be due to stricter city regulations forcing children to stay home.

Meanwhile, children in rural areas can move around and play with their peers more freely. Yeasmin *et al.* (2020) discovered that 35.7% of the children's parents had bachelor's degrees in the severe disorders group. Furthermore, children from urban families had a higher total score for depression, anxiety, and sleep disorders (63.3%). Meanwhile, the score for depression, anxiety, and sleep disorders in rural areas was 36.7% (Yeasmin *et al.*, 2020). Children and adolescents, according to Singh *et al.* (2020), will suffer more mental health consequences during the pandemic and lockdown than adults. (Duan *et al.*, 2020a) Duan *et al.* (2020) discovered that 22.28% of the children had scores above

the threshold for clinical depression symptoms (19 or higher). Furthermore, Duan *et al.* (2020) investigated respondents' current anxiety situation based on coping styles by gender and age variables, and the results revealed that teenagers' anxiety levels were significantly higher than children's ($p=0.01$).

Children with Special Needs's Health

Children with disabilities are more vulnerable to the pandemic's negative mental health consequences because they may lack an understanding of the reasons for pandemic-related changes, such as disruptions in routines and school closures (Aishworiya & Kang, 2020). According to the findings of a study conducted in Italy by Colizzi *et al.* (2020), behavioral problems were reported more intensely and frequently in children with Autism Spectrum Disorder (ASD) than before the pandemic. Emergency contact with a pediatric neuropsychiatrist was required in 19.1% of cases due to behavioral issues, while access to the hospital due to accident and emergency occurred in 1.5% of cases. Parents reported having difficulty managing their children's eating (23%), autonomy (31%), free time (78.1%), and structured activities (75.7%). Many parents reported that all activities were more complicated than before the pandemic.

During the pandemic, 27.7% of parents with children with ASD received support from the local health service, with the majority reporting both direct (70.1%, e.g., calls, video calls) and indirect (84%; e.g., messages, texts, homework) support, as well as support from schools and private therapists (73.3%). Only 2.2% of parents found each type of support beneficial during an ongoing emergency (Colizzi *et al.*, 2020). Among the 527 parents who participated in the study, 77% reported at least one need that could assist parents of children with ASD in dealing with ongoing emergencies. Home healthcare support was the most frequently reported need (29.9%), followed by center-based healthcare support (10.4%), easing quarantine restrictions (9.7%), ending lockdown (7.1%), and healthcare support in hospitals (7.1%) (Colizzi *et al.*, 2020).

The Impact of COVID-19 on Children's Education

The COVID-19 pandemic has also impacted education globally, with school closures aimed at reducing COVID-19 spread. According to a UNICEF report from April 2020, 188 countries were implementing national closures, and more than 1 billion children were at risk of being left behind due to school closures. Many countries have implemented distance education programs or online homeschooling to keep the world's children learning. However, transitioning from a traditional educational environment to distance and virtual learning will take time (Fitri *et al.*, 2020). The rapid transformation has created several obstacles and challenges (Adnan & Anwar, 2020). According to Duan *et al.* (2020), respondents reported that the pandemic impacted their learning and graduation. It could be caused by a long absence from a structured school setting, disrupting routines, boredom, and a lack of innovative ideas for engaging in various academic and extracurricular activities (Singh *et al.*, 2020).

According to Zhao *et al.* (2020), in China, 55.6% of students were interested in a homeschooling learning style at the start of the pandemic. However, only 37.7% of them could actively interact with teachers and classmates during online classes. In contrast to the questionnaire results, 74.3% of teachers felt they could interact with their students during online courses. However, the percentages decrease with the student's grade level, with 80.5%, 76.3%, and 60.4% in grades 1-3, 4-6, and 7-9, respectively. Furthermore, 35.2% of teachers believe this homeschooling style will increase their students' interest in learning; however, this percentage decreases with the student's grade level. Parents thought there was insufficient interaction during online classes. A total of 77.4% of parents believed that their children focused on learning during online courses, and this percentage increased as students progressed in grade.

Online class monitoring is considered necessary by 50% of parents (Zhao *et al.*, 2020). Homeschooling can make it difficult for parents to keep track of their children. Parents are compelled to homeschool their children to ensure the continuity of their children's

education. It is an additional burden for them, who are already dealing with issues like working from home or being out of work due to the pandemic and household chores. Many parents do not have the time or educational qualifications to assist their children with tasks that their teachers previously handled. It is likely to cause parental frustration, fatigue, and disruptions in their children's academic activities, resulting in stress for both parents and children (Mahapatra & Sharma, 2020). According to Zhao *et al.* (2020), classroom-based schools are preferred by 83.5% of students over homeschooling, and 95.6% of parents prefer classroom-based schools as well (Zhao *et al.*, 2020). Although online learning has been shown to assist in maintaining children's health during the COVID-19 pandemic, it is not as effective as traditional learning (Adnan & Anwar, 2020).

Implication for Nursing

The study implies a fundamental basis for health professionals, particularly nurses, to anticipate the impact of COVID-19 on the health and education sectors, especially on vulnerable populations such as children. Public health nurses are on the front line of the public health crisis the world now knows as the COVID-19 pandemic. Nurses also play a role with other health professionals to achieve the goal of SDG 3, which is focused on ensuring that everyone has good health and well-being. Public health nurses can work inter-discipline within communities to help prevent the adverse effects of COVID-19 on the child population. In their role as public health nurses, nurses can apply their clinical knowledge and expertise by mitigating and anticipating the impact of COVID-19 on children's health, emphasizing primary prevention, and implementing interventions in the form of nursing care at all levels—individuals, families, and communities—to maintain children's health and welfare. This systematic review is expected to describe the impact of COVID-19 on children, serving as a foundation for future research or practice to develop anticipatory assessments of the pandemic's impact on children's health and education. Hopefully, this study will help policymakers develop guidelines for assessing and intervening against the

pandemic's negative impact on children's health and education.

CONCLUSION

Our study highlights that COVID-19 negatively impacts children. There are several effects on health, including changes in physical activity to more sedentary behavior, delayed immunization, mental health, and the health of disabled children. COVID-19 has caused changes in the delivery learning process and various obstacles in the education sector. Therefore, it is necessary to develop further studies to develop interventions to anticipate the negative impact of the pandemic on the child population, especially in the health and education aspects. Other studies are also required to determine the extent to which the COVID-19 pandemic has impacted the achievement of SDGs 3 and 4.

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