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Sandra Elizabeth Piñeros-Ortiz, Marcelo Andrés Hernández-Yasnó, Franklin Escobar-Córdoba

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The moderation of this preprint received the endorsement of:
Jorge Eduardo Caminos Pinzón (ORCID: <https://orcid.org/0000-0001-9893-8272>)

IMPACT OF DISTANCE LEARNING AND THE FULL RETURN TO IN-PERSON CLASSES ON THE MENTAL HEALTH OF THE PEDIATRIC POPULATION DURING THE COVID-19 PANDEMIC.

Sandra Elizabeth Piñeros-Ortiz¹

<https://orcid.org/0000-0002-5951-3797>

Marcelo Andrés Hernández-Yasnó^{1,2}

<https://orcid.org/0000-0003-0176-0792>

Franklin Escobar-Córdoba^{1,3,4}

<https://orcid.org/0000-0002-0561-4883>

¹ Universidad Nacional de Colombia – Faculty of Medicine - Department of Psychiatry - Bogotá D.C., Colombia.

² Subred de Servicios de Salud Centro Oriente - Hospital Santa Clara - Bogotá D.C., Colombia

³ Hospital Universitario Nacional de Colombia – Sleep Laboratory - Bogotá D.C. - Colombia.

⁴ Fundación Sueño Vigilia Colombiana - Bogotá D.C., Colombia

Corresponding author: Franklin Escobar-Córdoba. Departamento de Psiquiatría. Facultad de Medicina. Universidad Nacional de Colombia. Oficina 202, Facultad de Medicina, Campus Universitario. Tel. 3165000 Ext. 15117-15187 - Telefax: 57 (601) 6036282 – Bogotá DC. – Colombia. E-mail: feescobarc@unal.edu.co

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Abstract

In March 2020, the closure of schools in most countries and the implementation of virtual education were ordered as a control measure to slow the spread of SARS-CoV-2. This, along with social distancing, represented a threat to the mental health of school children. In this context, access to information technologies was a determining factor in countering social isolation and allowing the continuity of the school's role in this population.

In this sense, several studies reported that the suspension of in-person classes and the use of virtual education, adopted because of the pandemic, had both positive and negative effects on the mental health of the pediatric population; conditioned by individual, family, and socioeconomic factors. Thus, in terms of development and mental health, the reopening of educational institutions after a prolonged period of mobility restriction and social distancing constituted both an opportunity and a challenge for the pediatric population and the family.

The objective of this article is to reflect on the differential impact that school closures and the implementation of virtual education during the COVID-19 pandemic had on the development and mental health of the school-aged population, and on the potential effects of returning to in-person education. It is hoped that this reflection will be useful in guiding the implementation of educational and child mental health care actions in future pandemics.

Keywords: Coronavirus Infections; Student Health; Mental Health; Social Isolation; Pandemics (MeSH).

Introduction

By the end of March 2020, it was estimated that 87% of primary and secondary school students worldwide (i.e., over 1.5 million children and young adults from 165 countries) were affected by school closures and the implementation of distance education based on information and communication technologies (ICT) as a measure to decrease the rapid spread of the new coronavirus SARS-CoV-2. (1) This decision, along with other measures of restricting human mobility and social distancing, represented a threat to the development and mental health of most children and adolescents, as well as an additional stress factor for their caregivers, who were already exposed to multiple stressors of the coronavirus disease 2019 (COVID-19) pandemic.¹

Although, unfortunately, it is currently not possible to assert that the entire child and adolescent population can easily access ICT, it can be said that access to these technologies and training in the use of these resources in the school environment allowed the implementation of virtual education as a measure to mitigate the mental and social risks of social isolation and disruption of school activities in this population during the pandemic.^{2,3} Likewise, the alteration of social and environmental factors involved in early childhood development as a result of the COVID-19 pandemic and the measures implemented for its control (illness or death of caregivers, limited opportunity for in-person interaction with peers, disruption of routines among others), also contributed to an increased risk of developing mental health problems in the pediatric population.^{4,5}

In this regard, several studies have shown a differential impact on the mental health of children and adolescents.^{6,7} There have been reports of an association between favorable and unfavorable changes in this population with sociodemographic variables, their own and their parents' health conditions, socioeconomic conditions, and other social determinants such as the prolonged closure of schools, which increased the financial burden and other responsibilities (e.g., teaching) for many parents, and the disconnection from the daily reality

to which children and adolescents were exposed (e.g., forced distancing from their classmates and friends).^{6,7}

While, as already mentioned, social distancing measures and restrictions on human mobility, in particular, the closure of schools and the cessation of in-person classes, had a negative impact on the mental health of children and adolescents, the decision made by governments of several countries, including Colombia, to reopen educational institutions and begin the gradual return to in-person classes until reaching 100% attendance, was questioned for fear of an increase in the number of infections.^{8,9} However, understanding both the differential effects of school closures and other social distancing measures on the mental health of children and adolescents, as well as the potential risks of a full return to schools and in-person classes, is of great importance for the implementation of actions from the education and health sectors that protect the mental well-being of children and adolescents and their caregivers.¹⁰

The objective of this article is to reflect, on the one hand, on the differential impact that school closures and the implementation of virtual education had during the COVID-19 pandemic on the development and mental health of children and adolescents, and on the other hand, on the potential effects of a full return to in-person education in these same aspects, in order to guide the most appropriate preventive actions in future pandemics. To this end, on March 31, 2022, a literature search was conducted in the Pubmed/MEDLINE, EMBASE, and SCOPUS databases, and in the Google Scholar search engine up to page 5 of results, with no publication date restrictions. Articles in English and Spanish were selected, and free terms ("COVID-19 Pandemic", "school closure", "lockdown", "mental health", "children and adolescents") were used. For greater sensitivity, articles that had matches in the title or abstract with the free terms used in the search were screened. A total of 156 publications were found, and forty of them whose objectives were in line with those of this work were included. The previous search was expanded on February 12, 2023, in the Google Scholar search engine up to page 5, using the terms "COVID-19 and mental health in

children in Colombia" and "return to in-person education and mental health in children in Colombia", using a filter from the year 2022. With this last search, 47 and 48 references were obtained, respectively, and two of them were selected whose objectives coincided with those of this work.

Virtual education during the COVID-19 pandemic: positive and negative aspects on the development and mental health of children and adolescents.

Although, for didactic purposes, different domains of human development are approached separately, cognitive development is linked to socioemotional development.¹¹ Throughout the lifespan, particularly in early childhood, meeting basic needs, opportunities for stimulation, establishing secure emotional bonds, and interacting with peers outside the family nucleus are fundamental aspects of healthy cognitive and socioemotional development.¹¹ Likewise, the cultural and social circumstances in which an individual is immersed during their childhood and adolescence, as well as the patterns of caregiving by their primary social networks (family, neighborhood), can function as promoting, protective, or risk factors in relation to their development.¹¹ In this sense, the complex interaction of these factors and the genetic vulnerability of children have a differential impact on their development and educational needs, as well as those of their families.¹¹⁻¹³

The use of virtual education in the context of the pandemic and post-pandemic eased the restart and continuity of classes for children and adolescents who had access to the necessary electronic devices and adequate internet connection in their family environment.¹⁴ In fact, it has been reported that the use of technological devices (e.g., smartphones, tablets, laptops) by schoolchildren and adolescents promoted learning and mitigated the negative psychological effects of social distancing during the pandemic, such as feelings of loneliness and boredom.¹⁵ However, virtual education coverage in primary and secondary education has been limited or non-existent for a large proportion of children and

adolescents in countries with significant social and economic inequities such as Colombia, reflected in the inability to access stable and fast internet connection and such technological devices.¹⁶ For example, a study of the school population revealed that 51% of public educational centers had access to high-speed internet, generating significant connectivity gaps when compared to private centers where the percentage reached 81%.¹⁷

Other social determinants involved in the differential impact of school closures on the development and mental health of children and adolescents include those related to the educational level and work conditions of caregivers, access to health services, location and type of housing, type of family and family dynamics, characteristics of other primary social networks, and belonging to ethnic and/or vulnerable groups such as migrant populations or victims of armed conflicts.¹⁸⁻²⁰ In addition to the role of these social determinants in the differential impact, it has been suggested to include the presence or history of medical conditions, sensory deficits, and neurodevelopmental disorders (NDD) (language disorders, autism spectrum disorders, specific learning disorders, attention-deficit/hyperactivity disorder (ADHD), intellectual disability), as well as other types of mental (MD) and psychological disorders such as anxiety, social phobia (SP), and depression in this analysis.⁶

Regardless of the presence or history of NDD and/or MD, the risks of virtual education with respect to the child and adolescent development and mental health in the context of school closures and confinement due to the COVID-19 pandemic were related to limitations in physical activity, reorganization of habits and routines, and restriction of in-person interaction with peers, which is essential for promoting language development and social cognition.²¹ However, it is important to mention that these risks could be mitigated or even eliminated in homes that had the necessary resources to promote leisure activities and physical activity, as well as social interaction with peers outdoors or in extracurricular spaces under biosecurity conditions.²¹

Other risks of virtual education are related to increased exposure to technological devices. Regarding this, it has been reported that virtual education and teleworking increased inappropriate use of the internet and smartphones, especially in vulnerable populations such as African Americans and those with limited economic resources. In the absence of adequate supervision, inappropriate use of the internet and screens promotes alterations in sleep habits, diet, physical activity, and self-care in both healthy populations and those with NDD and/or MD.^{21,22} Additionally, research conducted in populations with video game addiction in countries with experience in rehabilitating this type of addiction reports symptomatic worsening in adolescents with these problems during confinement due to the pandemic.²³

Other problems that affected children and adolescents and whose frequency also increased due to social distancing and the implementation of education included the use of psychoactive substances, domestic violence, and other forms of violence different from school-related ones, such as child sexual abuse. Additionally, it is important to mention that the reporting of these situations to the relevant authorities (police and social services) decreased during the pandemic lockdown.^{24,25} These issues highlighted the risks of social control measures adopted to slow down the spread of SARS-CoV-2, such as school closures and the establishment of virtual education, as they exposed children and adolescents to increased cohabitation with perpetrators of domestic violence, which is much more serious than the possible intrinsic deficiencies of virtual education in terms of learning in this population.

Research on the impact of virtual education on language development and other cognitive skills is still limited. Regarding this, Deoni *et al.*²⁶ in a longitudinal study analyzing 1224 cognitive assessments of 672 healthy children with normal cognitive development aged 3 months to 3 years, conducted from 2011 at a hospital in Rhode Island, USA, observed lower scores on global cognitive performance and verbal and motor tasks involved in learning processes of children carried out between 2011 and before March 2020 (1075 assessments;

605 children) compared to those obtained in tests carried out between March 2020 and June 2021 (154 assessments; 118 children). It is also important to mention that thirty-nine of these children were born just before the pandemic (2018 and 2019), and cognitive evaluations were conducted during the pandemic (in 2021). Finally, according to the results of the study, lower scores on these tasks were obtained by males and children from families with low socio-economic resources.²⁶

On the other hand, Frey & Verhagen,²⁷ in a study conducted using a dataset that included national biannual exam scores of 350,000 students (aged 8 to 11 years) in the Netherlands between 2017-2020, as well as their sociodemographic characteristics and the characteristics of the schools they attended, reported a loss of learning progress during school closures, which lasted 8 weeks from March 15 and was equivalent to one-fifth of a school year. Moreover, these losses were up to 60% greater in students from families with lower educational levels, confirming the role of social inequalities regarding the effects of the pandemic.²⁷

Regarding the positive effects of implementing virtual education during the pandemic on students, Larsen *et al.*²⁸ in a study conducted in Norway with 442 children (mean age=11.43 years; SD=2.59) from vulnerable families (defined as families in which parents had attended family welfare centers for mediation, counseling, or family therapy), indicate that participants reported improvements in terms of well-being and life satisfaction as a result of implementing virtual education during the closure of their schools, and related to aspects such as greater family cohesion (more time available to spend with family and more free time to engage in non-academic personal activities) and not having to commute to educational institutions. However, according to the same study, in those participants who reported symptoms of anxiety and/or depression during school closures, the severity of these symptoms was associated with their perception of instability and stress in their families.²⁸ In this sense, it is important to mention that, on the one hand, differences in the approach to the COVID-19 pandemic between high-income and low- or middle-income countries cannot be

ignored, and, on the other hand, morbidity and mortality in children and adolescents from COVID-19 varied from country to country depending on social determinants mediated by the economic situation of each country.²⁹

These findings highlight the diverse positive and negative effects of school closures and the implementation of virtual education during the pandemic on school and cognitive well-being, mental health, and the development of children and adolescents, which, rather than being due to direct exposure to virtual education, were mediated by individual and family factors. Regarding children and adolescents with neurodevelopmental and/or psychological disorders or with a history of these disorders, there was a trend towards worsening symptoms after the implementation of mobility restriction and social distancing measures (including strict confinement and school closures), although some of these children and adolescents also reported an improvement in terms of subjective and emotional well-being regarding their disorder.

Regarding this, Tombeau *et al.*⁷ conducted a study in Canada on a population of 1398 individuals between the ages of 2 and 18 (62% with a pre-existing diagnosis of the mental disorder prior to school closures) to determine changes in the mental health of this population across six domains (depression, anxiety, irritability, attention, hyperactivity, and obsessions/compulsions) through questionnaires completed by parents of children and adolescents aged 2-18 years old (n=1013) and self-report questionnaires completed by participants aged 10 years and older (n=347). According to these authors, depending on the age group, 67-70% of children/adolescents experienced deterioration in at least one of these domains, but between 19-31% experienced improvement in at least one domain.⁷ In addition, the impact of pre-existing psychiatric diagnoses was heterogeneous, as it was associated with deterioration in the domains of irritability, hyperactivity, and obsessions/compulsions in some children (ORs 1.96-2.23), but with improvement in the domains of depression, anxiety, and irritability for others (ORs 2.13-3.12).

Regarding improvement in the evaluated domains, it was found that 19.5% (n=181/927) of children and adolescents aged 6-18 years reported improvement in at least one of the six domains, while in 31.5% of children aged 2-5 years (n=17/54), improvement was evidenced in at least one of the three domains evaluated in this subgroup (anxiety, irritability, and hyperactivity). Finally, social isolation stress was associated with deterioration in the analyzed mental health domains (ORs=11.12-55.24), and a significant proportion of children and adolescents experienced deterioration in their mental health in at least one domain regardless of the age range (6-18 years: 70.2%; 2-5 years: 66.1%).⁷

Based on these findings, it is possible to say that the closure of schools and the implementation of virtual education in replacement of in-person classes in the context of the pandemic had more negative effects on the mental health of children and adolescents with neurodevelopmental disorders (NDD) and/or mental disorders (MD) than those without these conditions. This greater impact has been attributed to various factors such as caregiver overload, treatment disruption, inability to access in-person mental health services and interventions, and loss of adaptations that had been made in schools to ensure the learning process of these patients based on the characteristics of their disorder.³⁰

Therefore, it is clear that the negative effects experienced by children with NDD and/or MD in terms of mental health cannot be solely attributed to the closure of schools and the implementation of virtual education in replacement of in-person classes, but also to the barriers to access mental health and recreational services, which further increased during the pandemic, the inherent difficulties of implementing virtual education and its suitability to ensure adequate learning in this population, and the interruption of educational support at home due to mobility and social distancing measures implemented. On the other hand, several studies have reported that some mobility restriction and social distancing measures adopted in response to the pandemic, such as strict confinement and

the closure of schools, and the replacement of in-person classes with virtual education, had positive effects on the well-being and mental health of children with ADHD, anxiety, and behavioral problems. Regarding this, Bobo *et al.*³¹ in a study conducted in France in the early stages of the COVID-19 pandemic and in which the responses of 533 parents of children and adolescents with ADHD to a questionnaire on their symptoms and management during confinement were analyzed, found that, according to their parents, the children showed improvements in anxiety related to school and better self-esteem during confinement and school closure. According to these authors, the parents of these children associated these favorable changes with the relief of school and social pressures that their children had before the suspension of in-person classes, related to the stigma and discrimination to which they were exposed in schools due to their learning and behavioral problems.³¹

In conclusion, it is important to highlight that the studies cited here on the negative effects of social distancing measures in response to the COVID-19 pandemic such as school closures and the use of virtual education instead of in-person education on cognitive development, mental health, and learning processes of children and adolescents were conducted in countries with very different cultural and economic characteristics from Colombia (first world countries), since unfortunately, at the time this article was written, there were no published studies on the effects that compared cognitive, socio-emotional development, and school performance before and after the implementation of measures such as strict confinement and school closures and the suspension of in-person classes and their replacement by virtual education.

Return to in-person classes during the COVID-19 pandemic: positive and negative aspects on child and adolescent development and mental health.

The main concern with the implementation of the return to in-person classes in many countries, such as Colombia, was related to the perception of a higher risk

of COVID-19 contagion in this population, as they would be in school institutions where it was not possible to guarantee full compliance with the recommended biosecurity measures. This, in turn, was associated with significant concern about the possible spread of the virus to people who lived with the student, both in their homes and communities. This perception of danger was particularly high for those who, for various reasons, were not yet vaccinated, or who, despite being vaccinated, had chronic diseases or underlying conditions associated with higher morbidity and mortality from COVID-19.³²

It is also necessary to consider the fear that some children and adolescents had of contracting SARS-CoV-2 and infecting their loved ones upon returning to school, with the subsequent development of feelings of guilt associated with beliefs that they were the source of contagion in cases where a family member or close person died due to COVID-19. In these circumstances, the grieving process becomes more difficult.³³

Regarding this, Alvarado-Socarrás *et al.*³⁴ conducted a cross-sectional analytical study in Colombia, in which they analyzed 1,443 surveys answered by parents or caregivers of children attending pediatric consultations in different cities of the country, between August and September 2020. They found that 81.06% of parents disagreed with the return of their children to in-person classes and preferred virtual education as an educational alternative. The main factor associated with this decision was if the parent had a comorbidity, hypertension, ischemic heart disease, and obesity ($p < 0.0001$). However, factors such as having children over 10 years old (RP:2.64; 95%CI:1.48-4.72), living with people over 70 years old (RP:2.2; 95%CI:1.46-3.29), and knowing someone who died from COVID-19 (RP:1.86; 95%CI:1.42-2.44) were also associated with this decision. This study concluded that there was a trend in middle and high socioeconomic strata to maintain virtual education instead of in-person classes as a form of family protection. Still, further studies were required in low-income families, where greater negative effects resulting from the closure of schools and the suspension of in-person classes were assumed due to their vulnerability.³⁴

Finally, it should be mentioned that there were children and adolescents with NTDs and MDs before the pandemic, who had an exacerbation of anxious symptoms after the lifting of remote education measures and some of them resisted returning to in-person education. On the one hand, they were afraid of being exposed again to the difficulties they faced when attending in-person classes without adequate preparation for adapting to the in-person school environment. On the other hand, their emotional suffering may have been temporarily relieved thanks to virtual education and increased family cohesion resulting from spending more time at home.³⁵ Similarly, it is important to bear in mind that for some children and adolescents who were experiencing school bullying before the closure of schools, being distanced from the school environment, and staying at home could have a temporary protective effect, and the return to in-person classes could provoke rejection and school absenteeism.³⁶

The return to in-person education for many of these children, in the absence of adequate preparation and specialized intervention for their problems or MDs, was experienced as a source of stress that caused difficulties in readjustment and worsening of emotional problems for both them and their parents, and a high risk of resurgence of emotional and behavioral disorders due to social dynamics in schools (e.g. re-exposure to school bullying) and the probable greater academic demand. (36,37) In Colombia, although there is a lack of scientific evidence about an increase in the incidence of affective and behavioral disorders in the pediatric population after the full return to in-person education, there are alarming data on suicide rates in this population group that cannot be attributed exclusively to the potential effects of the return to in-person education. According to the National Institute of Legal Medicine and Forensic Sciences, between January and October 2022, there were thirty-four more suicides reported in the population under 18 years of age compared to the same period in 2021. It is worth noting that in Colombia, the full return to classes was ordered in July 2021, and that, in contrast to the suicide rates in children and

adolescents in 2022, in 2020 there were nine fewer suicides reported in the same age group compared to 2019.^{38,39}

Conclusions

Based on the evidence found, it is possible to affirm that both children and adolescents from precarious family environments and households subjected to deprivation in their care, as well as those exposed to different forms of domestic and community violence, could benefit from an early return to in-person education in future pandemics, as this would allow them to distance themselves somewhat from these environments, provided their rights are protected in the school context.

Likewise, the pediatric population with internet addiction problems and those with cognitive disabilities and learning disorders who cannot receive the necessary adjustments to ensure adequate teaching-learning-evaluation processes in the virtual education scenario will benefit from the return to in-person classes provided that teachers are well-trained to meet their educational needs and ensure their inclusion in the classroom and that there are clear rules in the coexistence manuals that protect them from negative situations to which they are more exposed due to these disorders, including discrimination, stigmatization, and school bullying.

However, just as the return to in-person classes brought benefits to some children and adolescents, it is also possible to assume that this return generated an increase in the frequency of anxiety symptoms and greater adaptation difficulties in a significant proportion of students, situations for which parents, educators, child and adolescent psychologists, psychiatrists, and other professionals were not prepared.

Finally, mandatory, and total return measures to in-person education when there is no clarity about the control of pandemics like COVID-19 can be

counterproductive, which is why a flexible and individualized educational model, adjusted to the child and family's mental health and sociocultural conditions, is proposed. Virtual remote education is an option if technological tools are available. Another alternative is to develop guidelines for home-based education, the alternation of in-person and remote education during crises or exacerbations of mental illnesses, or in the early stages of discharge from psychiatric hospitalizations.

It is important to consider that, based on the evidence presented above, some children and adolescents with mental health problems who experience crisis periods can benefit from the continuity of virtual or distance education, extended to early post-pandemic periods while their clinical stabilization is achieved and their access to professional care for the recovery of their mental conditions is ensured, similarly, those with a history of school bullying prior to pandemics, while the corresponding preventive actions are taken in the school environment.

Authors contributions

SEPO: Contributed to the conceptualization and design of the study.

SEPO and MAHY: Contributed to the collection and analysis of data.

SEPO, MAHY, and FEC: Contributed to the interpretation of results and conclusions.

SEPO, MAHY, and FEC contributed to the writing, critical review of the manuscript, and final editing.

Conflicts of interest

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References

1. Tang S, Xiang M, Cheung T, Xiang YT. Mental health and its correlates among children and adolescents during COVID-19 school closure: The importance of parent-child discussion. *J Affect Disord.* 2021;279:353–60.
2. Ávila García VA. La educación virtual en épocas de pandemia. La crisis neoliberal de los cuidados. *Trabajo Social.* 2021;23(1):273–93.
3. Ramírez-Ortiz J, Castro-Quintero D, Lerma-Córdoba C, Yela-Ceballos F, Escobar-Córdoba F. Mental health consequences of the COVID-19 pandemic associated with social isolation. *Colomb. J. Anesthesiol.* [Internet]. 2020 Sep. 7 [cited 2023 May 8];48(4). Available from: <https://www.revcolanest.com.co/index.php/rca/article/view/9304>.
4. Liang N, Becker TD, Rice T. Preparing for the COVID-19 paediatric mental health crisis: A focus on youth reactions to caretaker death. *Clin Child Psychol Psychiatry.* 2022;27(1):228–37.
5. Samji H, Wu J, Ladak A, Vossen C, Stewart E, Dove N, Long D, Snell G. Review: Mental health impacts of the COVID-19 pandemic on children and youth - a systematic review. *Child Adolesc Ment Health.* 2022;27(2):173-189. [https://doi: 10.1111/camh.12501](https://doi:10.1111/camh.12501).
6. Panda PK, Gupta J, Chowdhury SR, Kumar R, Meena AK, Madaan P, Sharawat IK, Gulati S. Psychological and Behavioral Impact of Lockdown and Quarantine Measures for COVID-19 Pandemic on Children, Adolescents and Caregivers: A Systematic Review and Meta-Analysis. *J Trop Pediatr.* 2021;67(1):fmaa122. <https://doi:10.1093/tropej/fmaa122>.
7. Cost KT, Crosbie J, Anagnostou E, Birken CS, Charach A, Monga S, et al. Mostly worse, occasionally better: impact of COVID-19 pandemic on the mental

health of Canadian children and adolescents. *Eur Child Adolesc Psychiatry*. 2022;31(4):671–84.

8. Correa Del Río A, González LI, Sepúlveda MM, Burón KV, Salinas AP, Cavagnaro SmF. Debate on the return to in-person classes in pandemic. *Andes Pediatrica*. 2021;92(2):174–81.

9. Eslava-Schmalbach J, Restrepo-Henao A, Guarnizo-Herreño C, Castillo JS, Vega-Romero R, Arbeláez MP, et al. Critical reflections on the municipal epidemiological resilience index used for public policy decision-making regarding the control of the COVID-19 pandemic in Colombia. *Rev. Fac. Med.* 2021;69(2).

10. Elharake JA, Akbar F, Malik AA, Gilliam W, Omer SB. Mental Health Impact of COVID-19 among Children and College Students: A Systematic Review. *Child Psychiatry Hum Dev*. 2023 Jun;54(3):913-925.

[https://doi: 10.1007/s10578-021-01297-1](https://doi.org/10.1007/s10578-021-01297-1).

11. Yurgelun-Todd D. Emotional and cognitive changes during adolescence. *Curr Opin Neurobiol*. 2007;17(2):251–7.

12. Yogman M, Garner A, Hutchinson J, Hirsh-Pasek K, Golinkoff RM; COMMITTEE ON PSYCHOSOCIAL ASPECTS OF CHILD AND FAMILY HEALTH; COUNCIL ON COMMUNICATIONS AND MEDIA. The Power of Play: A Pediatric Role in Enhancing Development in Young Children. *Pediatrics*. 2018;142(3):e20182058. [https://doi: 10.1542/peds.2018-2058](https://doi.org/10.1542/peds.2018-2058).

13. Allen SM, Daly KJ, Father Involvement Research Alliance, University of Guelph. Centre for Families W and WBeing. The effects of father involvement: an updated research summary of the evidence. Centre for Families, Work & Well-Being, University of Guelph; 2007. 53 p. Available from: https://library.parenthelp.eu/wpcontent/uploads/2017/05/Effects_of_Father_Involvement.pdf

14. Álvarez M, Gardyn N, Iardelevsky A, Rebello G. Educational segregation in times of pandemic: Balance of initial actions during social isolation by COVID-19 in Argentina. *Revista Internacional de Educacion para la Justicia Social*. 2020;9(3):25–43.

15. Romero Tena R, Llorente Cejudo C, Palacios Rodríguez A. Competencias Digitales Docentes desarrolladas por el alumnado del Grado en Educación

Infantil: presencialidad vs virtualidad. *EduTec Revista Electrónica de Tecnología Educativa*. 2021;(76):109–25.

16. Arias-Velandia N, Rincón-Báez WU. Educación básica y media durante el aislamiento social en la pandemia de COVID-19. *Panorama*. 2021;15(29):176–204.

17. Comisión de Regulación de Comunicaciones. República de Colombia. Informe ejecutivo del estudio infancia y medios audiovisuales. Apropiación, usos y actitudes. Available from: https://cocom.gov.co/system/files/Biblioteca%20Virtual/Estudio%20Infancia%20y%20Medios%20Audiovisuales.%20Apropiaci%C3%B3n%20usos%20y%20Actitudes%20-%20Informe%20ejecutivo/15-informe_ejecutivo_estudio_de_infancia_vf.pdf

18. Determinantes sociales de la salud: resultados de la Conferencia Mundial sobre los Determinantes Sociales de la Salud (Río de Janeiro, Brasil, octubre de 2011).

19. Parra Aguirre MA, Caza Chango SJ. Determinantes sociales y desafíos para la deconstrucción social de la pandemia por COVID-19. *Avances en Enfermería*. 2021;39(1 Supl):44–53.

20. Kim SJ, Bostwick W. Social Vulnerability and Racial Inequality in COVID-19 Deaths in Chicago. *Health Education and Behavior*. 2020;47(4):509–13.

21. Hoofman J, Secord E. The Effect of COVID-19 on Education. *Pediatric Clinics of North America*. 2021;68:1071–9.

22. Christensen MA, Bettencourt L, Kaye L, Moturu ST, Nguyen KT, Olgin JE, Pletcher MJ, Marcus GM. Direct Measurements of Smartphone Screen-Time: Relationships with Demographics and Sleep. *PLoS One*. 2016;11(11):e0165331. <https://doi:10.1371/journal.pone.0165331>.

23. King DL, Achab S, Higuchi S, Bowden-Jones H, Müller KW, Billieux J, et al. Gaming disorder and the COVID-19 pandemic: Treatment demand and service delivery challenges. *J Behav Addict*. 2022;11(2):243–8.

24. Kourti A, Stavridou A, Panagouli E, Psaltopoulou T, Spiliopoulou C, Tsolia M, Sergentanis TN, Tsitsika A. Domestic Violence During the COVID-19

Pandemic: A Systematic Review. *Trauma Violence Abuse*. 2023 Apr;24(2):719-745. <https://doi.org/10.1177/15248380211038690>.

25. Tener D, Marmor A, Katz C, Newman A, Silovsky JF, Shields J, Taylor E. How does COVID-19 impact intrafamilial child sexual abuse? Comparison analysis of reports by practitioners in Israel and the US. *Child Abuse Negl*. 2021;116(Pt 2):104779. <https://doi.org/10.1016/j.chiabu.2020.104779>.

26. Deoni SC, Beauchemin J, Volpe A, Dâ Sa V; RESONANCE Consortium. The COVID-19 Pandemic and Early Child Cognitive Development: A Comparison of Development in Children Born During the Pandemic and Historical References. *medRxiv [Preprint]*. 2022:2021.08.10.21261846.

<https://doi.org/10.1101/2021.08.10.21261846>.

27. Engzell P, Frey A, Verhagen MD. Learning loss due to school closures during the COVID-19 pandemic. *Proc Natl Acad Sci U S A*. 2021;118(17):e2022376118. <https://doi.org/10.1073/pnas.2022376118>.

28. Larsen L, Helland MS, Holt T. The impact of school closure and social isolation on children in vulnerable families during COVID-19: a focus on children's reactions. *Eur Child Adolesc Psychiatry*. 2022;31(8):1-11.

29. Santos JAF, Costa AM, Souza LEFP, et al. Effects of school closure on physical and mental health of children and adolescents during the COVID-19 pandemic: a systematic review. *Ciência & Saúde Coletiva*. 2021;26(suppl 2):4153-4172. <https://doi.org/10.1590/1413-81232021266.2.29882020>.

30. Colizzi M, Sironi E, Antonini F, Ciceri ML, Bovo C, Zoccante L. Psychosocial and Behavioral Impact of COVID-19 in Autism Spectrum Disorder: An Online Parent Survey. *Brain Sci*. 2020;10(6):341. <https://doi.org/10.3390/brainsci10060341>.

31. Bobo E, Lin L, Acquaviva E, Caci H, Franc N, Gamon L, et al. How do children and adolescents with Attention Deficit Hyperactivity Disorder (ADHD) experience lockdown during the COVID-19 outbreak? *Encephale*. 2020;46(3):S85-92.

32. Deoni SC, Beauchemin J, Volpe A, Dâ Sa V; RESONANCE Consortium. The COVID-19 Pandemic and Early Child Cognitive Development: A Comparison of

Development in Children Born During the Pandemic and Historical References. medRxiv [Preprint]. 2022:2021.08.10.21261846.

<https://doi.org/10.1101/2021.08.10.21261846>.

33. Fitzgerald DA, Nunn K, Isaacs D. What we have learnt about trauma, loss and grief for children in response to COVID-19. *Paediatr Respir Rev.* 2021;39:16-21. <https://doi.org/10.1016/j.prrv.2021.05.009>.

34. Alvarado, J., Quintero-Lesmes, D. C., Carmona-Valle, J. C., Franco-Lopez, M., & Niederbacher-Velásquez, J. (2021). Factores asociados a la decisión paterna sobre el retorno a clases presenciales en Colombia durante la pandemia COVID-19. *Salud UIS, 53*. <https://doi.org/10.18273/saluduis.53.e:21018>.

35. Vaillancourt T, Brittain H, Krygsman A, Farrell AH, Landon S, Pepler D. School bullying before and during COVID-19: Results from a population-based randomized design. *Aggress Behav.* 2021;47(5):557-569.

<https://doi.org/10.1002/ab.21986>.

36. De Souza VM, Levandoski G. Social distancing as a protective barrier against bullying actions among schoolchildren during the COVID-19 pandemic. *Work.* 2022;73(2):383-92.

37. Burak D. The Effect of Risk and Protective Factors on Primary School Students' COVID-19 Anxiety: Back to School After the Pandemic. *Child Indic Res.* 2023;16(1):29-51.

38. Forensis 2020, Datos para la vida. Instituto Nacional de Medicina Legal y Ciencias Forenses; 21st ed. Bogotá D.C., Colombia. 2022.

39. Forensis 2019, Datos para la vida. Instituto Nacional de Medicina Legal y Ciencias Forenses. 20th ed. Bogotá D.C., Colombia. 2020.

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