Journal of Community Medicine & Health Education

Frances PL, J Community Med Health Educ 2022, 12:5

Research Article Open Access

Evidence Based Practice Literature Review: How has the COVID-19 Pandemic Impacted Overall Health in School Aged Children?

Philip L. Frances*

Department of Occupational Therapy, Murray State University, USA.

Abstract

The COVID-19 pandemic has changed the lives of many individuals within local communities and different countries all over the world. The pediatric population is at a high risk to development health issues from the mandates imposed by the government to decrease the spread of the virus. These health effects are related to mental, physical, and social health factors. The ability for children to understand what is going on and their fears for their health and the future can create depressive and anxious mood disorders. These mental and physical health decreases can be directly related to home school experiences, eating habits and food insecurity, family stress and instability, as well as mood disorders and sleep disturbances. It is important to determine current health issues related to the COVID-19 pandemic to obtain future treatment for individuals affected by the pandemic.

Keywords: COVID-19; Pandemic; Mental health; Physical health; Social isolation

Introduction

How has the Covid-19 pandemic impacted overall health in school aged children?

The Covid-19 pandemic has changed the lives of thousands of individuals worldwide. The effect of the pandemic has created financial burden, mental and physical health issues, and numerous other challenges affecting daily life for many different populations. One population that has been affected resulting in impacts on daily life is the pediatrHow has the COVID-19 pandemic impacted overall health in school aged children?

The COVID-19 pandemic has changed the lives of thousands of individuals worldwide. The effect of the pandemic has created financial burden, mental and physical health issues, and numerous other challenges affecting daily life for many different populations. One population that has been affected resulting in impacts on daily life is the pediatric population. Children are at higher risk to changes in health due to the pandemic as the virus has caused mental, physical, social, and educational changes that can impact the cognitive function of children [1]. Mental and physical health challenges existed for the pediatric population before the pandemic. Depression and anxiety are among the most common mental health disorders in children and youth, with significant functional impairment, and an associated risk of suicide [2]. With increased uncertainties for the future outcomes of the pandemic, depression and anxiety could increase in children and youth.

The global COVID-19 pandemic has impacted the routine way of life due to governing restrictions placed on gathering places and limitations placed on capacity. Due to the restrictions imposed to contain the COVID-19 virus, different population groups have adapted to varying screen time levels, which may have a profound implication on children's physical and mental wellbeing [3]. Some data has revealed a substantial decrease in physical activity and an increase in screen time during the COVID-19 pandemic [4], which is one of the many different factors impacting overall health of the pediatric population.

Along with the mental and physical challenges that COVID-19 has created for children, issues with social health, normal child development, home school experiences, eating habits and food insecurity, family stress, family instability, and mood and sleep disorders have been seen [1]. With restrictions placed on social gatherings, expected changes in health due to decreased socialization can affect the typical development of the pediatric population as well [1]. A child's development is highly influenced by the environment in which they live. In an environment with social restrictions, where play and leisure activities are only possible within the home environment, where people wear masks, and the learning of facial expressions, dialogue, and language is restricted, potential negative outcomes can be created [5]. With these limitations and restrictions there is a tendency toward limitations in the formation of certain areas of the brain, including the social brain, with consequent impairment in the acquisition of cognitive, behavioral, social, and communication skills [5].

With social changes, the method of education delivery for children has also changed worldwide with many school districts changing to online learning formats. As of April 18, 2020, the COVID-19 pandemic forced closures in 188 countries around the world, severely disrupting the education process of over 1.7 billion children and adolescents [6]. Children may often have difficulties with online learning or may not be able to learn well without face to face interaction. This review focuses on how the COVID-19 pandemic has potentially impacted the overall health of school children.

Methodology

Participants

The participants of this study include a lot of different health care professionals and government officials. Some of the health care professionals included in this study are occupational therapists, physical therapists, physicians, nurses, and social workers. This study also includes children, adolescents, and young adults with an age range of 1-19 years old with no limitations related to gender, race, or health conditions. Children included in this study represent different nationalities and socioeconomic

***Corresponding author:** Philip L. Frances, Department of Occupational Therapy, Murray State University, USA, E-mail: pfrances@murraystate.edu

Received: 02-May-2022, Manuscript No. jcmhe-22-62553; **Editor assigned:** 04-May-2022, PreQC No. jcmhe-22-62553 (PQ); **Reviewed:** 18-May-2022, QC No. jcmhe-22-62553; **Revised:** 23-May-2022, Manuscript No. jcmhe-22-62553 (R); **Published:** 30-May-2022, **DOI:** 10.4172/2168-9717.1000754

Citation: Frances PL (2022) Evidence Based Practice Literature Review: How has the COVID-19 Pandemic Impacted Overall Health in School Aged Children. J Comm Med Health Educ 12: 754.

status. Studies of non-human subjects and experimental studies were excluded from this study. This study will focus mainly on school aged children and their families and how the COVID-19 pandemic has created health care concerns for this fragile population.

Interventions

Tele health: The COVID-19 pandemic has created a situation that many political and community officials are trying to navigate through. Many health care officials have attempted to establish a means of treatment during social distancing mandates. The physical distancing measures have mandated a rapid uptake of telehealth, and the use of other internet based interventions delivered to children and youth not traditionally considered hard to reach [2]. Clinicians and organizations previously hesitant to use these modalities are quickly adopting them [2]. Due to the increase in mental health concerns for children during the COVID-19 pandemic, the new telehealth intervention provides children and families with a means of obtaining mental health treatment. From the supportive evidence, children, and adolescents are more likely to have high rates of depression and most likely anxiety during and after enforced isolation ends [7]. The impacts of the COVID-19 pandemic have affected children of all ages, sociocultural groups, and socioeconomic status, but children with intellectual disabilities have been presented with additional challenges. Children with intellectual disabilities are especially vulnerable to the physical, mental, and social effects of the pandemic. Physical isolation from support systems and peers can exacerbate underlying behavioral health issues, particularly in children with developmental disabilities for whom the community supports are critical and for children with mood disorder [8] (Figure 1).

Figure 1: Children have missed or delayed preventive appointments and utilized telehealth during the pandemic

Physical activity in children

When determining physical activity changes during the COVID-19 pandemic, one study analyzed data from 2426 children and adolescents with valid data on physical activity and sedentary behavior. Moderate and vigorous intensity, physical activity was measured based on a Global Physical Activity Questionnaire (GPAQ) which was developed by the world health organization [4]. The Global Physical Activity Questionnaire is used as a survey and requires participates to self-report amounts of physical activity. The study highlights that time spent performing physical activity decreased drastically during the pandemic [4]. It is well-known that reduced physical activity and prolonged sedentary behavior are linked to both negative physical and mental health outcomes, such as a loss of muscular and cardiorespiratory fitness, weight gain, psychosocial problems, and poor academic achievements. [4]. The pandemic experience may become an adverse childhood experience and generate toxic stress, with consequent potential loss for brain development, individual and collective health, and the long term impairment of cognitions, mental physical health, and working capacity for future adults [5]. Xiang et al., revealed a substantial decrease in physical activity and increase in screen time during the COVID-19 pandemic and concludes that interventions for physical activity need to be established by governments, schools, professionals for health and exercise, and parents (2020) [4].

Social isolation

Life during the pandemic has created mental health and physical health concerns but another important consideration that is in high correlation with overall health is social health. The government has attempted to intervene and contain the virus, but mandates are creating health issues within various populations. Children and adolescents are experiencing a prolonged state of physical isolation from their peers, teachers, extended families, and community networks [7]. Due to the restrictions placed and home schooling, screen time has been an intervention tool that has increased significantly since the start of the pandemic. Preliminary evidence reports significant decreases in physical activity, increases in sedentary behaviors, and disrupted sleep schedules/sleep quality in children and adolescents during the COVID-19 pandemic [3].

Outcome measures

The studies included in this review provide a focus on how the COVID-19 pandemic has affected overall health in school aged children. The outcome measures focused on mental health including qualitative (emotional reactions, somatic/cognitive reactions, and worry reactions). These measures were used to assess children's reactions to the new everyday life with home schooling and social isolation [9]. Home school experience was assessed with four statements about how children have managed home schooling, their concentration level, and home school support or lack of support [9]. Other measures included in the Larsen et al study included daily screen time use, missing friends and worry about virus infections [9]. The Quílez-Robres et al, review included instruments such as demographic and socio-educational questionnaires and Beck's anxiety inventory [10]. The demographic and social-educational questionnaire includes questions that were related to the type of family structure, number of children, type of home, profession, employment situation during the crisis, family conflicts, household chores, and school homework [10]. Beck's anxiety inventory is designed for a collection of information in a self-reported format that allows measuring the degree of anxiety and the aspects or symptoms less related to depression [10].

Physical activity since the start of the pandemic has decreased and sedentary behaviors have increased due to isolation protocols and other mandates. In the Xiang study, outcome measures were based on surveys given to children in schools in China [4]. The outcome measure that was used in this study was based on Global Physical Activity Questionnaire (GPAQ) developed by the World health organization and measured moderate and vigorous intensity of physical activity during the COVID-19 pandemic [4].

Headey et al, reported that school closures affect both physical activity and nutrition. Along with the decreases in physical activity, children are at higher risk for starvation due to school closures [11]. Schools provide children with two daily meals that they are guaranteed to receive. School closures have increased the stress placed on families due to financial outcomes and decreased employment. The unprecedented global, social, and economic crisis triggered by the COVID-19 pandemic poses a great risk to the nutritional status and survival of young children in low income and middle income countries [11]. The nutrition that a child needs and the nutrition that a child receives daily can heavily impact the development of that child. The economic, food, and health system disruptions from the COVID-19 pandemic are expected to continue to exacerbate all forms of malnutrition [11].

Social health is affected directed by the COVID-19 due to the many mandates that have been created in attempts to flatten the curve. Loades ei al. is a study that used the impact of loneliness on mental health as its outcome measures [7]. Seven studies stated that they measured the impact of social isolation on mental health, at the social isolation measures used were withering subscales or questions from loneliness scales, or strongly overlapped with the construct of loneliness [7]. These studies included school aged children and university students. While social isolation has proven useful to stop spreading the virus, social epidemiology research shows that comorbidity of physical illness and mental disorders is higher, especially in the absence of positive social relations [12]. One-third of parents whose children had been subjected to disease containment measures said that their child had needed mental health service views because of their pandemic related experiences. [7]. One instrument used to obtain this information included a PTSD Checklist Civilian Version. The PTSD Checklist is used to score symptoms related to disease containment measures to determine a score on the UCLA PTSD Reaction Index [7]. Social distancing and school closure may therefore increase mental health problems in children and adolescents, already at high risk of developing mental health problems compared to adults at a time when they are also experiencing anxiety over health problems compared to family employment/income. [7].

Search strategies

A collection of keywords was applied to Google Scholar with the use of preferred reporting items for systematic reviews and meta-analyses (PRISMA). The collection of key phrases included the effects of COVID-19 on education, COVID-19 effects on children's health, child development issues COVID-19 school closures COVID-19 and COVID-19 impact on overall health in children. Roughly, 137 total articles were yielded from the Google Scholar search. Inclusion criteria included studies of children and adolescents with no limitations related to gender, race or socioeconomic status. Exclusion criteria excluded studies of non-human subjects and experimental studies. Of the total articles found, 18 articles were included for this study based on inclusion and exclusion criteria. The articles that were included were published from January 2020-December 2020 and included numerous population groups with a primary focus on children and their families. Research articles were excluded if they did not discuss health impacts on children during the COVID-19 pandemic.

Data collection and analysis

Data was collected and analyzed through researching articles that were related to the COVID-19 pandemic and how this virus has impacted the overall health of school aged children. Most articles included in this literature are primary research articles and meta-analyses. All the articles included interviews and focus groups which are the most common methods of data collection used in performing qualitative healthcare research. The purpose behind performing interviews for this qualitative research is to explore the views, experiences, and beliefs of the COVID-19 pandemic to determine the effects of the virus.

Results

The research presented from the numerous articles included in this review concluded that the COVID-19 pandemic has created a negative effect on the overall health of school aged children and their families. The research determined that areas such as mental health, physical health and social health have diminished during this unprecedented time. Other areas of focus for this review includes child development, home school experiences, eating habits and food insecurity, family stress and instability, mood and sleep disorder, and the health of children with intellectual disabilities. The articles included in this study is evidence presented from systematic reviews or meta-analysis, which classifies these articles as level one on the scale of levels of evidence.

Four studies were included to determine the effects of COVID-19 on mental health in school age children, [2,9,10,13]. Courtney et al determined that depression and anxiety is among the most common mental disorders in children and youth, with significant functional impairment, and an associated risk of suicide [2]. The associated restrictions that were made to decrease the spread of the COVID-19 virus can be correlated to an increase in depression and anxiety in school age children. Quilez-Robres, et al., found that these associated restrictions due to the COVID-19 pandemic have had a negative impact on people's social, family, and educational lives [10]. This study discusses more on how exact restrictions affect health based on mental health and physical health changes. Imran et al. discussed that children were not immune to the many psychological impacts of the COVID-19 pandemic and that children experienced fears, uncertainties, large changes to their routines, physical and social isolation alongside high levels of parental stress [13]. Children are especially susceptible to the stresses caused by the pandemic due to their limited understanding of the event. They are unable to escape the harms of the situation both physical and mentally as they have limited coping strategies and they may not be able to successfully communicate how they feel Imran et al, and Larsen, et al. determined that some COVID-19 related variables such as home schooling experiences, child perceived family stress and instability, screen times use missing friends and worry about virus infection are associated with children's emotional, somatic/cognitive and worry reactions [9,13].

Four studies were included to determine how the COVID-19 pandemic has affected physical health in school aged children [3-5,14]. Xiang et al. determined that some data has revealed a substantial decrease in physical activity and an increase in screen time has increased during the COVID-19 pandemic [4]. This increase in screen time is contributed by homeschooling online and an increase in social media participation due to children missing their friends and family. Araujo et al., discussed how the COVID-19 pandemic has created restrictions to the maintenance of outside activities and weight loss programs, encouraged a sedentary lifestyle due to social distancing and a ban on attending gyms, parks, and leisure areas, alongside an increase in the consumption of canned food and industrialized foods containing fever essential nutrients for the developing brain, resulting in a negative impact on the growth of children and adolescents [5]. Bates et al. further discusses how the restrictions imposed to contain the COVID-19 virus, different population groups have adapted to varying screen time levels, which may have profound implication on children's physical and mental wellbeing [14]. Bates et al. revealed that some preliminary evidence since the onset of the COVID-19 pandemic related quarantine measures have demonstrated sizable increases in screen time consumption Physical activity is associated with numerous health benefits for children and adolescents, including cardio metabolic health, motor skills development, bone density, and emotional regulations/psychological health [14].

To determine the effects of the COVID-19 pandemic on social health in school aged children. Three studies were included to address this issue [7,11,12]. Children and adolescents are experiencing a prolonged state of physical isolation from their peers, teachers, extended families, and community networks [7]. The duration of quarantine, fear of infection, boredom, frustration, lack of vital supplies, lack of information, financial loss, and stigma seem to increase the risk of negative psychological outcomes [7]. While social isolation has proven useful to stop spreading the

virus, social epidemiology research shows that comorbidity of physical illness and mental disorder is higher, especially in the absence of positive social relationships [12]. From the supportive evidence, children, and adolescents are probably more likely to experienced high rates of depression and most likely anxiety during and after enforced isolation ends [7].

Discussion

The COVID-19 pandemic has created significant effects worldwide effecting every age population. The global pandemic has changed the 'normal' routine of everyday life. The restrictions imposed by the government and other health care professionals has been proven effective in decreasing the spread of the virus, but these mandates have created health concerns worldwide. Some specific factors that will be addressed in this literature that has led to negative impacts on school aged children include home school experiences, eating habits and food insecurity, family stress and instability, and mood and sleep disorders. All these factors correlate with overall negative health changes within the pediatric population.

When COVID-19 began to take attention of government and community officials, school closures were one of the first actions taken to prevent the spread of the virus to school aged children and to prevent contact tracing. Many children may relate forced school closures to an extended version of a school holiday. The gap in mathematical and literacy skills between children from lower and higher socioeconomic backgrounds often widens during closed school periods [15]. The pandemic is not considered a holiday but some of the adverse education effects may still apply to our current education situation.

A child's development is also considered to be highly influenced by the environment in which they live. Due to the forced isolation, the learning environment and the nature of educational interactions changed drastically. The learning environment and the nature of educational interactions play an important role in the cognition process, not only due to discovering new knowledge and the construction of certain intellectual structures, but also due to the socialization aspect [6]. Efficient learning occurs in a social context through the exchange of views, joint problem solving, negotiating meanings, and group discussion [6]. Disrupting the education process directly affects the health of children due to preventing typical childhood development and by possibly creating additional challenges for these individuals as they enter adulthood.

School closures have presented numerous problems for typical childhood development. Another important consideration that directly impacts overall health in school aged children is eating habits and food insecurity. The education of children worldwide is of extreme importance, but school closures also affect other aspects of a child's life such as food insecurity. Food insecurity is always defined as the persistent worry or concern about access to adequate amounts of affordable and nutritious foods [16]. For many students living in poverty, schools are not only a place for learning but also for eating healthily [15].

Since the beginning of the pandemic, unemployment rates have increased and obtaining the necessary needs has become challenging for many families. Among children and adolescents, exposure to food insecurity is associated with dietary inadequacies, impaired growth and development, low educational achievement, cognitive deficits, and chronic physical and mental health problems [16]. Along with the creation of food insecurity, daily eating habits for the pediatric population has been interrupted as well. Stress, bouts of starvation and food cravings during times of financial hardships are thought to promote binge eating episodes [16]. These factors such as food insecurity are directly related to restrictions to education and could potentially exacerbate anxiety and depression of children that have recently been made to continue school from home.

The home schooling experience and decreased ability to obtain the necessary needs for families has increased family stress and instability. Parents play an essential role in helping their children buffer stress by helping them manage their feelings and understand their own experiences. However, this buffering requires a parent who is sufficiently emotionally and physically capable to do so [2]. Many parents result to negative outcomes for dealing with increased stress such as increased substance abuse and in severe cases child abuse. The pandemic experience of COVID-19 aggravates the rates of substance abuse, domestic violence, and untreated and pre-existing mental health problems [5].

The increase in family stress and instability creates a negative impact on overall health in school aged children. The lack of social care and monitoring during a lockdown means that domestic violence and child abuse may go unreported [17]. Researchers have found that all types of child abuse become more frequent during school holidays, summer breaks, and natural disasters [17]. Sadly, some isolated cases of child abuse during the lockdown with probably not be detected because the family was not officially "at risk" and/or because the abused children have not returned to school [17].

The daily routines of many children have been affected in many ways. Moods and sleep disorders, in different types and varieties, make up one of the most diagnosed psychological problems in children and adolescents worldwide [18]. Anxiety and depressive disorders have complex and bidirectional relationship with sleep disorders [18]. The mood and sleep disorders created by the COVID-19 pandemic can become even greater if not treated and children may experience these mood and sleep disorders in later stages of life and may worsen in adulthood.

Clinical Implications

Implications for occupational therapy practice: Occupational therapy plays a major role in recovery from the COVID-19 pandemic and has changed the way occupational therapists deliver occupational therapy services in many different locations such as hospitals. COVID-19 has created additional challenges for occupational therapist in high risk settings. It is important to consider the health effects on occupational therapy practitioners as they navigate through this unprecedented time. These health effects can include mental and physical health issues. Some occupational therapists have been forced to change their method of delivering services from in person meetings to online telehealth services. The change in service delivery might present additional challenges for current and new occupational therapy practitioners who are inexperienced this idea can create additional stress for the practitioner. Along with changes in the process of delivery therapeutic services, mental health issues could be expected to rise due to the extended hours and other factors pertaining to emotional regulation techniques.

Implications for education: The COVID-19 pandemic has created many challenges for people worldwide requiring constant modification to ensure the safety of local communities and countries. The education process has changed significantly. The delivery method of education can now all be performed digitally. They can have positive effects and negative effects as some children may find it hard to learn digitally. It is important to continue to conduct research to determine to the effectiveness of online learning. Along with adjustments made to the education processes, health providers have now determined alternative methods for treatment delivery. Online telehealth and other services have gained vast popularity and offer many individuals the means of obtaining the

treatment they so desperately need.

Implications for education: The COVID-19 pandemic has changed the lives of numerous individuals worldwide. There have been negative health impacts in school aged children related to physical, mental, and social health. Currently, we can determine short term effects of the COVID-19 pandemic, but it is important to consider the long term health effects that could potentially arise from the pandemic. Research should be directed to monitoring health effects related to the virus. It is necessary that the potential long term consequences of COVID-19 mitigation measures are considered by decision makers and public health stakeholders to design and implement timely strategies that could diminish the impact that lockdown may have on children's lifestyle [19].

Conclusion

The COVID-19 pandemic has created many challenges for children and families across the world. The pandemic has created negative impacts for overall health in school aged children. These negative impacts include effects on mental, physical, and social health. Anxiety and depression are among the highest mental health disorders reported in the pediatric population. The restrictions that were made to decrease the spread of the coronavirus could be a potential cause of increases in mental health issues within children.

Due to children's decreased ability to understand the pandemic fully can create additional emotional stress and other mental health disorders. Along with mental health, children's physical health has been impacted by the COVID-19 pandemic as well. Children have been forced to complete schoolwork from home which has increased the average amount of screen time in children. Screen time encourages sedentary behavior and decreases the amount of physical activity performed daily. Perhaps one of the biggest disruptions in health for children during the pandemic is the change from in person classes to at home online courses, which has a direct negative impact of childhood development.

The home schooling experience also possesses concern for healthy eating habits and food insecurity, family stress and instability, and mood and sleep disorders. Children attend school for educational purposes, but nutrition is a big factor that is included in the schooling process. For most children, schools provide two meals a day and without access to schools many children may not be receiving the proper nutrition they need. Along with the burden of food insecurity, family stress and instability greatly impact the overall health in school aged children during the COVID-19 pandemic.

Due to increased rates of unemployment, many families worldwide are experiencing difficulties with obtaining funding for essential supplies and household materials. This daily uncertainty has created additional family stress and many parents have difficulties with coping with the challenges presented by the pandemic. The rates of substance abuse and domestic violence have increase during the pandemic with many cases being left unreported. Finally, another important consideration to consider when discussing the overall health impacts related to COVID-19 is mood and sleep disorders. The changes in everyday routine and sleep scheduling are directly related to the development of mood disorders. The impacts to mental, physical, and social health in school aged children need to continue to be researched to determine long term health effects and other disorders that may potentially develop due to the COVID-19 pandemic.

Conflicts of Interest

The author declares that she has no conflicts of interest or competing interests.

References

1. Chanchlani N, Buchanan F, Gill PJ (2020) Addressing the indirect effects of COVID-19 on the health of children and young people. CMAJ 192(32): E921-E927.
2. Courtney D, Watson P, Battaglia M, Mulsant BH, Szatmari P (2020) COVID-19 impacts on children and youth anxiety and depression: challenges and opportunities. Can J Psychiatry 65(10): 688–691.
3. Sultana A, Tasnim S, Bhattacharya S, Hossain MM, Purohit N (2020) Digital screen time during COVID-19 pandemic: A public health concern. F1000Research 1-5.
4. Xiang M, Zhang Z, Kuwahara K (2020) Impact of COVID-19 pandemic on children and adolescents' lifestyle behavior larger than expected. Prog Cardiovasc Dis 63(4): 531–532.
5. Araújo LA, Veloso CF, Souza de M, Azevedo JM, Tarro G (2020) The potential impact of the COVID-19 pandemic on child growth and development: A systematic review. J Pediatr 97:369-377.
6. Parczewska T (2020) Difficult situations and ways of coping with them in the experiences of parents homeschooling their children during the COVID-19 pandemic in Poland. Education 49: 1–12.
7. Loades ME, Chatburn E, Sweeney HN, Reynolds S, Shafran R, et al. (2020) Rapid systematic review: the impact of social isolation and loneliness on the mental health of children and adolescents in the context of covid-19. J Am Acad Child Adolesc Psychiatry 59(11): 1218-1239.
8. McLoughlin J, O'Grady MM, Hallahan B (2021) Impact of the COVID-19 pandemic on patients with pre-existing mood disorders. Ir J Psychol Med 38: 1–10.
9. Larsen L, Helland MS, Holt T (2020) 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 26: 1-11.
10. Robres AQ, Moyano N, Cortes A (2021) Motivational, emotional, and social factors explain academic achievement in children aged 6–12 years: A meta-analysis. Educ Sci 11(9): 513.
11. Headey D, Heidkamp R, Osendarp S, Ruel M, Scott N, et al. (2020) Impacts of COVID-19 on childhood malnutrition and nutrition-related mortality. Lancet 396(10250): 519–521.
12. Urbina AG (2020) Young children's mental health: Impact of social isolation during the covid-19 lockdown and effective strategies. PsyArXiv 1-12.
13. Imran N, Zeshan M, Pervaiz Z (2020) Mental health considerations for children & adolescents in COVID-19 Pandemic. Pak J Med Sci 36: S67–S72.
14. Bates L, Zieff G, Stanford K, Moore J, Kerr Z, et al. (2020) COVID-19 impact on behaviors across the 24-hour day in children and adolescents: Physical activity, sedentary behavior, and sleep. Children 7(9): 138.
15. Lancker VW, Parolin Z (2020) COVID-19, school closures, and child poverty: A social crisis in the making. Lancet Public Health 5(5): e243-e244.
16. Paslakis G, Dimitropoulos G, Katzman DK (2020) A call to action

to address COVID-19–induced global food insecurity to prevent hunger, malnutrition, and eating pathology. Nutr Rev 79(1): 114–116.

17. Caron F, Plancq MC, Tourneux P, Gouron R, Klein C (2020) Was child abuse underdetected during the COVID-19 lockdown? Arch Pediatr 27(7): 399–400.

18. Lavigne CR, Costa LB, Juárez RMR, Fernández RM., Sánchez MLM., et al. (2021) Consequences of covid-19 confinement on anxiety, sleep and executive functions of children and adolescents in Spain. Front Psychol 12: 565516.

19. Ventura PS, Ortigoza AF, Castillo Y, Bosch Z, Casals S, et al. (2021). Children's health habits and covid-19 lockdown in catalonia: Implications for obesity and non-communicable diseases. Nutrients 13(5): 1657.