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Review article

Impact of COVID-19 and lockdown on mental health of children and adolescents: A narrative review with recommendations[☆]Shweta Singh^a, Deblina Roy^{b,*}, Krittika Sinha^c, Sheeba Parveen^c, Ginni Sharma^c, Gunjan Joshi^c^a Additional Professor, Department of Psychiatry, KGMU Lucknow, India^b Psychiatric Nursing, Department of Psychiatry, King George's Medical University, Lucknow, India^c Department of Psychiatry, King George's Medical University, Lucknow, India

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ABSTRACT

Background: COVID-19 pandemic and lockdown has brought about a sense of fear and anxiety around the globe. This phenomenon has led to short term as well as long term psychosocial and mental health implications for children and adolescents. The quality and magnitude of impact on minors is determined by many vulnerability factors like developmental age, educational status, pre-existing mental health condition, being economically underprivileged or being quarantined due to infection or fear of infection.

Aims: This paper is aimed at narratively reviewing various articles related to mental-health aspects of children and adolescents impacted by COVID-19 pandemic and enforcement of nationwide or regional lockdowns to prevent further spread of infection.

Methodology: We conducted a review and collected articles and advisories on mental health aspects of children and adolescents during the COVID-19 pandemic. We selected articles and thematically organized them. We put up their major findings under the thematic areas of impact on young children, school and college going students, children and adolescents with mental health challenges, economically underprivileged children, impact due to quarantine and separation from parents and the advisories of international organizations. We have also provided recommendations to the above.

Conclusion: There is a pressing need for planning longitudinal and developmental studies, and implementing evidence based elaborative plan of action to cater to the psycho social and mental health needs of the vulnerable children and adolescents during pandemic as well as post pandemic. There is a need to ameliorate children and adolescents' access to mental health support services geared towards providing measures for developing healthy coping mechanisms during the current crisis. For this innovative child and adolescent mental health policies with direct and digital collaborative networks of psychiatrists, psychologists, paediatricians, and community volunteers are deemed necessary.

1. Introduction

There are more than 2.2 billion children in the world who constitute approximately 28% of the world's population. Those aged between 10 to 19 years make up 16 % of the world's population (UNICEF, 2019). COVID-19 has impacted the lives of people around the world including children and adolescents in an unprecedented manner. Throughout the world, an essential modus of prevention from COVID- 19 infection has been isolation and social distancing strategies to protect from the risk of infection (Shen et al., 2020). On these grounds, since January, 2020,

various countries started implementing regional and national containment measures or lockdowns. In this backdrop one of the principal measures taken during lockdown has been closure of schools, educational institutes and activity areas. These inexorable circumstances which are beyond normal experience, lead to stress, anxiety and a feeling of helplessness in all.

It has been indicated that compared to adults, this pandemic may continue to have increased long term adverse consequences on children and adolescents (Shen et al., 2020). The nature and extent of impact on this age group depend on many vulnerability factors such as the

[☆] This paper is aimed at reviewing articles related to mental-health aspects of children and adolescents impacted by COVID-19 pandemic and lockdowns. There is a need to carry out longitudinal and developmental studies and plan strategies to enhance children's and adolescent's access to mental health services during and after the current crisis. For this direct and digital collaborative network of psychiatrists, psychologists, pediatricians, and community volunteers are of vital importance.

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developmental age, current educational status, having special needs, pre-existing mental health condition, being economically under privileged and child/ parent being quarantined due to infection or fear of infection. The following sections discuss about findings of studies on mental-health aspects of children and adolescents impacted by COVID-19 pandemic and lockdowns being implemented at national or regional levels to prevent further spread of infection.

2. Material and methods

We searched the electronic data bases of MEDLINE through PubMed, Cochrane Library, Science-direct and Google Scholar databases, from January,2020 till June,2020. We carried out the search with the following methods like, MeSH or free text terms and Boolean operators were employed for PubMed; COVID-19 and Children [All Fields] OR (Children and COVID-19 effects [Terms] OR & Psychological effects of COVID-19 on children "[All Fields] OR (" COVID effects on children "[All Fields] AND " "[All Fields]) OR effects on Children "[All Fields]) OR ("COVID-19 and children "[MeSH Terms] OR " Psychological effects of COVID-19, Children "[All Fields]. This search strategy and terms were modified for other databases as appropriate. The searches were done by five independent reviewers. A manual search was also conducted of the references of the related articles to gather information about the relevant studies. Initial PubMed search with the term with “ COVID-19 in children” showed only 12 results. Among these, only four articles were related to “Psychological effects of COVID in children”. Therefore in order to make the review more comprehensive and informative, we also included studies that reported the effect on older children and impact of COVID-19 on their lives. This was done keeping in mind the varied terminologies used to describe the phenomenon of ‘Children and COVID-19’. After using the above strategy, our search showed 112 results. Only articles in English language peer reviewed journals were included. Grey literature such as conference proceedings were not included due to possibility of insufficient information. We included case studies and review articles and Advisories by the WHO (World Health Organization), APA (American Psychiatric Association) and NHS (National Health Services) and Government of India Ministry of Health. Based on these inclusion criteria we included 22 articles. Three independent authors participated in study selection and all authors reached a consensus on the studies to be included. Being a narrative review, we did not attempt computation of effect sizes or do a risk of bias assessment for included papers.

The studies included were categorized under eight headings divided in various thematic sections and discussed with studies and reports found. The data is qualitatively analysed and reported in the paper. A summary of the papers included in this narrative review is presented in [Table 1](#).

2.1. Impact on young children

Stress starts showing its adverse effect on a child even before he or she is born. During stress, parents particularly pregnant mothers are in a psychologically vulnerable state to experience anxiety and depression which is biologically linked to the wellbeing of the foetus ([Biaggi et al., 2016](#); [Kinsella and Monk, 2009](#)). In young children and adolescents the pandemic and lockdown have a greater impact on emotional and social development compared to that in the grown-ups. In one of the preliminary studies during the on-going pandemic, it was found younger children (3-6years old) were more likely to manifest symptoms of clinginess and the fear of family members being infected than older children (6-18 years old). Whereas, the older children were more likely to experience inattention and were persistently inquiring regarding COVID-19. Although, severe psychological conditions of increased irritability, inattention and clinging behaviour were revealed by all

children irrespective of their age groups ([Viner et al., 2020a](#)). Based on the questionnaires completed by the parents, findings reveal that children felt uncertain, fearful and isolated during current times. It was also shown that children experienced disturbed sleep, nightmares, poor appetite, agitation, inattention and separation related anxiety ([Jiao et al., 2020](#)).

2.2. Impact on school and college going students

Globally, the pre-lockdown learning of children and adolescents predominantly involved one-to-one interaction with their mentors and peer groups. Unfortunately, the nationwide closures of schools and colleges have negatively impacted over 91% of the world's student population ([Lee, 2020](#)). The home confinement of children and adolescents is associated with uncertainty and anxiety which is attributable to disruption in their education, physical activities and opportunities for socialization ([Jiao et al., 2020](#)). Absence of structured setting of the school for a long duration result in disruption in routine, boredom and lack of innovative ideas for engaging in various academic and extra-curricular activities. Some children have expressed lower levels of affect for not being able to play outdoors, not meeting friends and not engaging in the in-person school activities ([Lee, 2020](#); [Liu et al., 2020](#); [Zhai and Du, 2020](#)). These children have become more clingy, attention seeking and more dependent on their parents due to the long term shift in their routine. It is presumed that children might resist going to school after the lockdown gets over and may face difficulty in establishing rapport with their mentors after the schools reopen. Consequently, the constraint of movement imposed on them can have a long term negative effect on their overall psychological wellbeing ([Lee, 2020](#)).

A study found that older adolescents and youth are anxious regarding cancellation of examinations, exchange programs and academic events ([Lee, 2020](#)). Current studies related to COVID-19 demonstrate that school shut downs in isolation prevent about 2-4% additional deaths which is quite less if compared to usage of other measures of social distancing. Moreover, they suggest to the policy makers that other less disrupting social distancing strategies should be followed by schools if social distancing is recommended for a long duration ([Lee, 2020](#); [Sahu, 2020](#); [Viner et al., 2020a](#)). However, in current circumstances, it is controversial whether complete closure of school and colleges is warranted for a prolonged period.

It has been reported that panic buying in times of distress indicate an instinctual survival behaviour ([Arafat et al., 2020](#)). In present pandemic era there has been a rise in the hoarding behaviour among the teenagers ([Oosterhoff et al., 2020a](#)). It is also found that among youth social distancing is viewed primarily as a social responsibility and it is followed more sincerely if motivated by prosocial reasons to prevent others from getting sick ([Oosterhoff et al., 2020a](#)). Further, due to prolonged confinement at home children's increased use of internet and social media predisposes them to use internet compulsively, access objectionable content and also increases their vulnerability for getting bullied or abused ([Cooper, 2020](#); [UNICEF, 2020b](#)). Worst of all, during lockdown when schools, when legal and preventative services do not functioning fully, children are rarely in a position to report violence, abuse and harm if they themselves have abusive homes.

2.3. Impact on children and adolescents having special needs

There are about 1 in every 6 children within the age group of 2-8 years who have some or the other neurodevelopmental, behavioural or emotional difficulty ([CDC, 2019](#)). These children with special needs [autism, attention deficit hyperactivity disorder, cerebral palsy, learning disability, developmental delays and other behavioural and emotional difficulties] encounter challenges during the current pandemic and lockdown ([CDC, 2019](#)). They have intolerance for uncertainty and there is an aggravation in the symptoms due to the enforced restrictions and unfriendly environment which does not correspond with their regular routine. Also, they face difficulties in

Table 1
Articles on mental health and psycho-social aspects of COVID among children and adolescents.

Sl.	Thematic area	Author and Year	Articles	Findings	Conclusions
1	School closures during COVID-19	Viner, R.M et al. (2020).	<i>School closure and management practices during coronavirus outbreaks including COVID-19: A rapid systematic review</i> Lancet Child Adolescent Health	This systematic review included 16 articles on Closure of schools in China and its impact on transmission on COVID-19. Studies using modelling method showed that closing the schools in itself contributes to 2-4% additional prevention of deaths due to COVID-19, which is quite less than using other methods of social distancing. School routines are crucial for young people with mental health challenges as schools help them to cope and structure their behavior. Children with special education needs are at high risk. Also since the pandemic and lockdown has caused economic distress, there are indications of increased abuse towards children. A large number of children have been quarantined in addition to the adult population. Quarantine policies have been developed keeping in mind the impact of quarantine on mental health aspects of children Survey of 2111 individuals [age <= 25 years] with history of mental health conditions in UK. The current pandemic and lockdown worsened their condition. About 26% of them were unable to access the mental health services. Since support groups and 'face to face services' were stopped. Certain activities and routines were important coping mechanisms. Support by tele or online services was found challenging by some youth.	For academic social and psychological reasons, Policy makers need to consider combinations of social distancing measures which are less disrupting if restrictive social distancing policies are needed for long periods. Since the pandemic is ongoing it is crucial to provide psycho social support to the minors who are highly vulnerable and are exposed to various economic and social stressors.
2	Mental health effects of School Closures	Lee, J. (2020)	<i>Mental health effects of school closures during COVID-19.</i> Lancet Child & Adolescent Health.	Children with special education needs are at high risk. Also since the pandemic and lockdown has caused economic distress, there are indications of increased abuse towards children. A large number of children have been quarantined in addition to the adult population. Quarantine policies have been developed keeping in mind the impact of quarantine on mental health aspects of children Survey of 2111 individuals [age <= 25 years] with history of mental health conditions in UK. The current pandemic and lockdown worsened their condition. About 26% of them were unable to access the mental health services. Since support groups and 'face to face services' were stopped. Certain activities and routines were important coping mechanisms. Support by tele or online services was found challenging by some youth.	Paediatric health care workers need to focus on the emerging mental health issues of children. Recommendations should be made for early identification of mental health issues and appropriate referrals and management. It was recommended that maintenance of social contact with families and friends by tele services or social platforms would help to reduce stress. However, excessive social media use should be under check.
3	Mental health considerations for children quarantined	Liu,J.,Bao Y.,Huang X.,&Lu Lin,(2020).	<i>Mental health considerations for children quarantined because of COVID-19.</i> Short review	The March poll, which interviewed 757 students before the first postponement of the Diploma of Secondary Education (DSE) exam – showed that over 20 per cent reported that the level of stress faced by them was maximum (10 / 10). The students reported feeling 'helpless' in this condition. A collaborative working group of China-EPA-UNEPSA found	The measures suggested to the parents and their families were to increase communication with minors, playing collaborative games, encouraging physical activity, and music therapy . Moreover, parents need to focus on sleep problems and nightmares in children, and forbid augmented sleep during the daytime
4	Impact on Young People with Mental Health Needs	The mental health charity Young Minds, 2020	<i>Coronavirus: Impact on Young People with Mental Health Needs.</i> 2020. Survey	A collaborative working group of China-EPA-UNEPSA found	Among youth it is found that social distancing is viewed primarily as a social responsibility and is followed more sincerely if it is motivated by prosocial reasons to prevent others from getting sick, hence prosocial motivation for this cause should be encouraged.
5	Stress in students due to postponement of exams	Ng Kang chug, 5 April 2020	<i>Coronavirus: stress over university entrance exams has skyrocketed amid Hong Kong school closures, study finds.</i> (survey) South China morning post	chlingness, difficulty in attention, and being irritable as commonest psychological conditions shown by all minors. Media entertainment was largely successfully used by families as a means to relieve their children's distress. 98.1% respondent adolescents shared that they engaged in at least some method of maintaining social distancing. they found that different motivations for social distancing were related with the symptoms of anxiety and depression and feeling of burdensomeness and belongingness.	The experience of the study provides suggestions to deal with stress and provide support for children and adolescents with eating disorders in the present during periods of crisis.
6	Behavioral and Emotional Disorders in Children	Jiao, W. X., Wang, L. N., Liu, J., Fang, S. F., Jiao, F. Y., Pettoello-Mantovani, M., & Somekh, E. (2020)	<i>Behavioral and Emotional Disorders in Children during the COVID-19 Epidemic.</i> The Journal of Paediatrics. Commentary	Adolescents' Motivations to Engage in Social Distancing during the COVID-19 Pandemic: Associations with Mental and Social Health.	The experience of the study provides suggestions to deal with stress and provide support for children and adolescents with eating disorders in the present during periods of crisis.
7	Associations of social distancing with Mental and Social Health in adolescent.	Oosterhoff,B,et al (2020)	<i>Adolescents' Motivations to Engage in Social Distancing during the COVID-19 Pandemic: Associations with Mental and Social Health.</i>	Adolescents' Motivations to Engage in Social Distancing during the COVID-19 Pandemic: Associations with Mental and Social Health.	The experience of the study provides suggestions to deal with stress and provide support for children and adolescents with eating disorders in the present during periods of crisis.
8	Children and adolescents with eating disorders	David.C et al (2020).	<i>Caring for children and adolescents with eating disorders in the current COVID-19 pandemic: A Singapore perspective.</i> Journal of Adolescent Health.	Adolescents' Motivations to Engage in Social Distancing during the COVID-19 Pandemic: Associations with Mental and Social Health.	The experience of the study provides suggestions to deal with stress and provide support for children and adolescents with eating disorders in the present during periods of crisis.

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Table 1 (continued)

Sl.	Thematic area	Author and Year	Articles	Findings	Conclusions
9	Diagnosis, treatment, and prevention COVID 19 infection in children	Shen K, Yang Y, Wang T, Zhao D, Jiang Y, Jin R, et al.	<i>Diagnosis, treatment, and prevention of 2019 novel coronavirus infection in children: experts' consensus statement.</i> World J Pediatr 2020.	that "Coronaphobia" effected the patients' visits and increased existing health anxiety in some people. An expert committee was called to gather consensus and standardize COVID 19 prevention and management in children. It was found that psychological counselling improves rate of recovery. If children have complaint of mood swings, fear or psychological disorder timely psychological management is warranted.	Methods of promotion of healthy and balanced diet, maintaining oral health, physical exercise, proper rest, avoidance of fatigue, and enhancing immunity are prescribed measures to prevent infection, and improving mental health

following instructions, understanding the complexity of the pandemic situation and doing their own work independently. With the closure of special schools and day care centres these children lack access to resource material, peer group interactions and opportunities of learning and developing important social and behavioural skills in due time may lead to regression to the past behavior as they lose anchor in life, as a result of this their symptoms could relapse (Lee, 2020). These conditions also trigger outburst of temper tantrums, and conflict between parents and adolescents. Although prior to the pandemic, these children had been facing difficulties even while attending special schools, but in due course they had learnt to develop a schedule to adhere to for most of the time of the day (APA, 2020; Cortese et al., 2020; UNICEF, 2020a). To cater to these challenges, it is difficult for parents to handle the challenged children and adolescents on their own, as they lack professional expertise and they mostly relied on schools and therapists to help them out (Dalton et al., 2020).

Since every disorder is different, every child has different needs to be met. The children with autism find it very difficult to adapt to the changing environment. They become agitated and exasperated when anything is rearranged or shifted from its existing setup. They might show an increase in their behavioral problems and acts of self-harm. It is a huge challenge for parents to handle autistic children due to lockdown. The suspension of speech therapy and occupational therapy sessions could have a negative impact on their skill development and the achievement of the next milestone, as it is difficult for them to learn through online sessions (UNICEF, 2020a). The children with Attention Deficit Hyperactivity Disorder (ADHD), struggle to make meaning of what is going around them from the cues they get from their caregivers. It is difficult for them to remain confined to a place and not to touch things, which might infect them. Due to being confined to one place the chances of their hyperactivity increases along with heightened impulses and it becomes difficult for the caregivers to engage these children in meaningful activities (Cortese et al., 2020).

Obsessive compulsive disorder (OCD) among the children and adolescents is estimated to be of 0.25%–4% among children and adolescents (CDC, 2019). Children with OCD are suspected to be one of the most affected ones by this pandemic. Due to obsessions and compulsions related to contamination, hoarding, and somatic preoccupation, they are expected to experience heightened distress. Cleanliness is one key protective measure against the spread of COVID-19. According to United Nations' policy guidelines to fight the infection one has to be careful about washing their hands six times a day, and whenever they touch anything (APA, 2020; United Nations, 2020). The lockdown, which has made the healthy population distressed about possessing enough food and prevention related resources like masks and sanitizers, has made it worse for people with hoarding disorder (APA, 2020; Mukherjee et al., 2020)

2.4. Impact of lockdown on underprivileged children

Social inequality has been associated with the risk of developing mental health challenges. The pandemic and lockdown world has experienced global economic turn-down which has directly worsened the pre-existing social inequality. In developing countries, with the imposed lockdown, the underprivileged children face acute deprivation of nutrition and overall protection. The prolonged period of stress could have a long term negative impact on their development. For instance, in India, which has the largest child population in the world with 472 million children, the lockdown has significantly impacted 40 million children from poor families. These include children working on farms, fields in rural areas, children of migrants and street children (Dalton et al., 2020; Rosenthal et al., 2020). An increasing number of poor and street children now have no source of income, making them a high risk population to face abuse and mental health issues with greater vulnerability and exposure to unfavorable economic, social and environmental circumstances (Birla, 2019).

A home represents a source of security and safety in most families. However, for the poor and the underprivileged it is just the

opposite. With the restriction of movement due to lockdown, these children have increased risk of being exploited and become victims of violence and abuse (Cooper, 2020; United Nations, 2020). The Deputy Director of 'CHILDLINE 1098' India, announced that India saw a 50 per cent increase in the calls received on helpline for children since the lockdown began (PTI, 2020). This increase in rate is alarming and has made an increasing number of child victims in their own homes.

During the time of lockdown an increasing number of poor families have no source of daily wages which lead to frustration and feelings of helplessness. By the reason of displacement, the frustration and family conflict may manifest itself in the form of violence towards children. This can make the child more vulnerable to depression, anxiety and suicide (Jiao et al., 2020; Petito et al., 2020; Solantaus et al., 2020) School closure coupled with economic adversity may force children and adolescents into child labour. Likewise, children without parents or guardians are more prone to exploitation (United Nations, 2020).

In order to cover up the loss of education during lockdown, many schools have offered distance learning or online courses to students. However, this opportunity is not available to underprivileged children as a result of which they face a lack of stimulation and have no access to online resource material to study. A study pointed out that in underprivileged families, in comparison to boys, girls have decreased access to gadgets, this may diminish their involvement in digital platforms of education (McQuillan and Neill, 2009). Due to this gender inequality, increasing number of girls are prone to bear the consequences of school dropouts once the lockdown is lifted (Cooper, 2020; PTI, 2020).

2.5. Impact due to quarantine and separation from parents

COVID-19 infection is expressed differently in children and adolescents. Yet the incidents of infection in the minors have been reported worldwide, which result in children being quarantined. Moreover, in many cases a single parent or both the parents are infected and quarantined. In either condition children are separated from their parents. Many countries have laid down strict quarantine policies as a measure to fight COVID-19 pandemic. Such as in China several adults, adolescents and children have been put in complete isolation to control the spread of infection. Although quarantining measures are for the benefit of the community at large, its psychological effects cannot be ignored (Liu et al., 2020). The children who are in isolation require special attention as these children might be at risk of developing mental health problems due to grief caused by of parental separation. As during the formative years of life, the role of parents is very crucial, any disruption in the form of isolation from parents can have long term effects of perceived attachment of the child. It is found that separation from the primary caregivers can make a child more vulnerable and can pose a threat to a child's mental health (Cooper, 2020; Jiao et al., 2020; Liu et al., 2020). The children may develop feelings of sadness, anxiety, fear of death, fear of parents' death and fear of being isolated in the hospital which may have a very detrimental effect on their psychological development (APA, 2020; CDC, 2019; Dalton et al., 2020). Children have emotionally pent up feelings of distress which may turn inwards into emotional fear or outwards towards acting out behavior (Liu et al., 2020). They might feel separated or alone as they have limited knowledge and level of maturity to understand the implications of the current pandemic situation in their limited world.

2.6. Advisories of international organizations

With the objective of universal prevention and mental health promotion, the International organizations and advisory bodies have issued various guidelines taking into account the mental health needs of children during the COVID-19. They have suggested parents to interact constructively with the children by communicating with them about the current pandemic, according to their maturity level and their ability to comprehend the crisis. Parents should plan their children's tasks one at a time, involve them in

various home activities, educate them about following hygiene habits and social distancing, engage in indoor play and creative activities. In addition to these activities, adolescents are advised to be involved in household chores and understand their social responsibilities (WHO, 2020b) Interventions supervised by adults can help them in understanding their concerns. The activities of children and adolescents should include more structure in home schooling activities. Children should be encouraged to socialize with their friends and classmates through digital forums under adult supervision (WHO, 2020a).

The advisory committees have also provided guidelines for managing children with special needs and neurodevelopmental disorders (UNICEF, 2020a, 2020b; WHO, 2020a) The children prone to risk for trauma and heightened anxiety. The children need early identification prompt management involving the parents and experts to prevent long term mental health morbidity.

2.7. Recommendations

It is imperative to plan strategies to enhance children and adolescent's access to mental health services during and after the current crisis. For this direct and digital collaborative network of various stakeholders is required. Recommendations for ensuring mental well-being of children and adolescents during the COVID-19 pandemic and lockdown and the role of parents, teachers, pediatricians, community volunteers, the health system and policy makers are being discussed. In addition a brief summary of the roles is given in Table 2.

2.8. Role of Parents

In the times of paramount stress and uncertainty, a secure family environment which the parents can provide is a strong protective factor (Schofield et al., 2013). There is evidence to show that parental practices and coping measures affect the children's post disaster mental health (Cobham et al., 2016). Parents need to respond to the needs of their children based on the developmental phase of the child is being discussed below:

2.9. Young children

1. Compared to adolescents, younger children demand **more attention** of their parents They need their parents' physical presence and need to engage in more indoor play related activities with them. Parents should devote time to provide the child with undivided, positive attention and reassurance.
2. With the aim to **increase children's awareness about COVID 19**, it is crucial for parents to communicate with young children in an age appropriate manner by using simple terminologies about COVID-19. Children need to be given fact based information with the help of presentations and video material provided by authorized international organizations like WHO and UNICEF or government resources which have been tailor made especially for children.
3. To **alleviate the anxiety** of children regarding the current uncertain situation (Wang et al., 2020), children's exposure to news should be limited and be through fact based neutral news channels only. The tabloid news should be avoided by all means.
4. The parents are recommended to **model appropriate preventive measures and coping mechanisms** which the family as a team and children individually are motivated to follow. For this use of reminders through phone may also be used.
5. Efforts should be made so that a **consistent routine is** followed by the child, with enough opportunities to play, read, rest and engage in physical activity. It is recommended that family plays board games and engages in indoor sports activities with the child to avoid longer durations of video games. Parents should ensure that particularly the bedtime of a child is consistent. It is possible that before the bed time children may need some more time and attention.

Table 2
Mental health care of children and adolescents by various support systems.

S. no.	Target Group/Support System	Primary Roles
1	Young Children <i>Parents</i> <i>Paediatrician</i> <i>Teachers/School counsellors</i> <i>Mental Healthcare Workers</i>	Healthy parenting, engaging in interactive play activities, practising mental health hygiene, maintain consistent routine, promoting health behavior Screening of vulnerable children, educating parents about developmental needs of children, managing mild stress and anxiety in children, referring to mental health care professionals Educating about COVID-19, mental health promotion, coordinating with parents, referring to mental health care professionals Providing psychoeducation by tele- counselling, orienting brief diagnostic and psychological assessment tools to paediatricians, providing tele-therapy, providing face to face therapy following social distancing measures if necessary
2	School going children and adolescents <i>Teachers/ School counsellors</i> <i>Parents</i> <i>Peer Group</i> <i>Online support systems</i> <i>Mental Healthcare Workers</i>	Life skill training, Educating about COVID-19, promoting Mental health, referring to mental health care professionals Practicing healthy communication, mental health hygiene, being positive role models, practicing adaptive coping Providing supportive role, problem solving Providing supportive role, referring to mental health care professionals tele counselling, providing online orientation for teachers, creating material for school teachers and school counsellors related to mental health promotion, life skill training, coordinating with parents
3	Children with special needs <i>Parents</i> <i>Special schools</i> <i>Community Volunteers</i> <i>Mental Healthcare Workers</i>	Participating in management of behavior problems, maintaining consistent routine, promoting health behavior Educating about COVID-19, Mental health promotion, referring to mental health care professionals Identifying high risk children, Providing psychological first aid, coordinating with care givers, referring to mental health care professionals Providing teleconsultations, providing parent-focused interventions and mental-wellbeing interventions, weighing risks and benefits of psychotropic medications
4	Underprivileged/vulnerable children <i>Parents</i> <i>Community Volunteers</i> <i>NGOs</i> <i>Police</i> <i>Mental Healthcare Workers</i>	Healthy parenting, being supportive, problem solving Providing psychological first aid, financial empowerment if possible, coordinating with care givers, referring to mental health care professionals identify high risk children, providing psychological first aid, coordinating with care givers and mental health care professionals Providing psychological first aid, referring to mental health care professionals Creating material for community volunteers and NGOs for identifying high risk children e.g. underprivileged children, children of migrants, provide psychological first aid, coordinating with care givers and mental health care professionals.
5	Quarantined parents/children <i>Parents</i> <i>Community Volunteers</i> <i>Foster care givers</i> <i>Mental Healthcare Workers</i>	If child is separated to keeping contact as much as possible, being supportive and reassuring Coordinating with care givers, referring to mental health care professionals Being supportive, reassuring and educating Constructing and administering online questionnaires in order to detect psychological distress and other symptoms for children if they or their parents are quarantined, providing extra support to them and developing ad hoc supportive interventions.

- Focus should be on the 'good behaviour' more than 'bad behaviour' of a child. Parents must tell more about options regarding what to do rather than what not to do. Provide more praise and social reinforcements to children compared to material reinforcements.
- It is quite possible that parents observe some amount of change in the behavior in children during the times of a pandemic. If the **behavior problems** are minor and not harmful for children and others, parents should consider ignoring and stop paying attention to them, this may lead to decrease in the recurrence in behavior and would also help in giving space to each other.

2.10. Adolescents

Apart from areas discussed above, certain areas which need especial focus in the phase of adolescence, are being described below:

- Parents are the best 'role model'** for children and home is practically the best place to learn the 'life skills'. Hence, this is the best time for parents to model the most important life skills i.e. coping with stress, coping with emotions, and problem-solving with their children. Due to the cancellation of exams handle disappointments and uncertainties more positively. For each disappointment and uncertainty, there should be an alternative. Moreover, to inculcate a sense of control in adolescents whenever possible, parents can include adolescents in the decision-making process especially in matters related to them.
- Adolescents are expected to have better **knowledge about COVID 19** compared to young children. Therefore, communication has to be more open and non-directive. On the other hand, judgmental statements about adolescents should be avoided.
- This is an opportunity for older children to **learn responsibility, accountability, involvement, and collaboration**. By taking some responsibilities at home on an everyday basis, for instance maintenance of their belongings and utility items. They can learn some of the skills including cooking, managing money matters, learning first aid, organizing their room, contributing to managing chores like laundry, cleaning and cooking.
- Excessive internet** use e.g. internet surfing related to COVID-19 should be avoided as it results in anxiety. Similarly, excessive and irresponsible use of social media or internet gaming should be cautioned against. Negotiations with adolescents to limit their time and internet-based activities are recommended. More non-gadget related in door activities and games are to be encouraged.
- In such conditions taking up **creative pursuits** like art, music, dance and others can help to manage mental health and well-being for everyone. Inculcating self-driven reading by making them select books of their choice and discussing about them helps in adolescent development.
- Adolescence is a phase of enthusiasm and risk-taking, hence some may feel invincible and **try not to follow guidelines** related to distancing and personal hygiene. This has to be addressed with adolescents assertively.
- It is crucial to value the **peer support system** of the adolescents. Parents should encourage adolescents who are introverts to keep in touch with their peers and communicate with them about their feelings and common problems they face. This may also lead a way for appropriate problem-solving.
- It is advised to **parents to take care of their own mental health** needs and try to cope with stress adaptively.

2.11. Role of school teachers/school counselors

In the present times when most schools and colleges are organizing online academic activities, teachers are in regular touch with students, and therefore are in a position to play a critical role in the promotion of psychological well being among youngsters. Their role during COVID-19 pandemic and lockdown are as follows:

1. Teachers can devote some time related to **educating about COVID-19** and preventive health behavior by using the guidelines of the international organizations, according to the maturity level of the students. They can explain to the students about the need to act with responsibility during the current pandemic. They can model and enact through their behavior the preventive measures.
2. They can **conduct creative online** academic and non-academic sessions by making their classes more interactive, engaging students in the form of quizzes, puzzles, small competitions, and giving more creative home assignments to break the monotony of the online classes. Standard educational material can be used. For instance, UNESCO has offered many online educational sources (UNESCO, 2020)
3. Teachers have a role to play in the **promotion of mental health among students**. They can discuss what is wellbeing and how it is important for students. They can assist in teaching simple exercises, including deep breathing, muscle relaxation, distraction, and positive self-talk. Virtual workshops can be conducted in which 'life skills' related to coping in stress can be in focus by using more practical examples.
4. Teachers can make children understand the importance of **prosocial behavior** and the importance of human virtues like empathy and patience among others. This can help them to understand their role in the society and understand how social distancing is not equivalent to emotional distancing.
5. The teachers need to **interact with parents** online or through phone regarding feedback about students and their mental health. Because of the digital divide they can call parents, make their contact available to parents and devote a time slot when they can be available to parents to communicate.
6. They can serve as a doorway for **identification and referral to specialty mental health providers**. They have a role act as a catalyst between the parent based on their interaction with students and findings of screening tools. If they observe any problem in the child, they can talk to parents and refer children and adolescents to mental health professionals.
7. With the support of school authorities, teachers need to make arrangements to ensure that the **reading material related academics and life skills is made available to the underprivileged children** who do not have access to the internet. If possible arrangements can be made for them to use internet.

2.12. Role of pediatricians

During a child's formative years when their personalities are shaped, **parents are in regular** touch with pediatricians, as parents reach out to their local pediatricians whenever they encounter health/behavioral complaints associated with their children. Parents expect answers from them as they trust them. Hence a pediatrician's role is paramount in promoting mental health, developing resilience, recognizing mental health problems, and coordinate with the mental health care providers when it comes to mental health care of children. In the backdrop of COVID 19 specific roles of pediatricians are enlisted below:

1. They must be equipped with a **teleconsultation** facility and must use it as much as possible. They must generously keep the option open for tele or online consultation for parents.

2. They should **educate parents** about the developmental needs of the children in various phases of childhood and also disseminate simple and specific mental health promotion reading material online or through handouts to parents.
3. Paediatrician is in a position to **recognize the physical manifestations** of stress and emotional health problems in children e.g. the various internalization and externalizing conditions, for instance, aches, pains, or acts of self-harm.
4. They also need to ask about the relevant information related to various **predisposing factors associated with the child** i.e. temperament, functioning, adjustment in school, peer group, routine and general activities of the child.
5. Various **psychosocial and medical determinants and stressors** of mental health like family history, economic stressors, family environment, neighborhood, etc. which may lead to underlying problems can be assessed.
6. **Mental health check-ups** should be conducted with the help of brief standardized screening tools by which they can easily screen various mental health problems in children especially including ADHD, autism, anxiety disorders, and depression.
7. They need to **develop stronger networks** and build partnerships with mental health providers, for instance, clinical psychologists, child psychologists, and psychiatrists. They should work in collaboration with them and refer children to them as and when the need arises for special mental health care. There is a need to develop online CMEs with the help of partnerships with Psychologists.

2.13. Mental healthcare workers

During times of paramount stress when the mental health of children and adolescents around the globe is directly or indirectly impacted, the role of mental health care workers, including clinical psychologists, psychiatrists, and psychiatric social workers is crucial keeping in mind their professional responsibilities and social challenges.

1. There is a need for '**tele mental health compatibility**' in place of in-person assessments and interventions. The objective of the mental health care providers should be to reach out to the general public at large. They need to work towards the production and dissemination of audio-video material related to healthy parenting, mental health awareness, reduction of stigma, practice mental health hygiene, promote health behavior, and psycho-educational material associated with the mental health care of children and adolescents.
2. There is an urgent requirement of **coordinated and innovative mental health** care delivery. For this, coordination with people who are playing a key role in the mental health care of children and adolescents e.g. parents, pediatricians, teachers, school counselors, community volunteers, NGOs, police, etc. should be involved and oriented about the mental health condition and briefly trained in providing basic psychological support and psychological first aid.
3. Providing online **orientation for teachers** or the creation of material for school teachers and school counselors related to mental health promotion, life skill training, coordination with parents, and referral to mental health care professionals.
4. Conducting brief online training of **pedsiatricians** for mental health screening of vulnerable children, assessment of psychosocial factors, providing inputs relevant for the management of mild stress and anxiety in children, and referring to mental health care professionals is included.
5. Creating material for **special schools** for mental health promotion and management of behavior problems using contingency management, providing psychological first aid, referring to mental health care professionals would be required.
6. Create material for **community volunteers** for identification of

high-risk children, e.g. underprivileged children, children of migrants, provide psychological first aid, and coordinate with caregivers and mental health care professionals.

7. Mental health care workers should focus on the construction and administration of **online questionnaires** to detect psychological distress and other stress symptoms in children if they or their parents are quarantined and also provide extra ad hoc supportive interventions.
8. Clinical Psychologists should design and implement tele based or in-person **short term focused behavioral interventions** for the management of known conditions in children [e.g. ADHD, autism, intellectual disabilities] mostly parent-focused, initiated using digital and electronic medium. The pathological consequences of crisis e.g. PTSD, depression, substance abuse in adolescents should also be addressed on similar lines. There is a requirement for creative solutions, often on a case-by-case basis.
9. Psychiatrists need to carefully weigh **the risks and benefits of psychotropic medications** for children and adolescents e.g. antidepressants, anxiolytics, anticonvulsants, etc., and if possible, arranging medicines for those who cannot arrange.
10. There is a need for mental health care workers carry out longitudinal **and developmental studies** on short term and long term mental health impact of the COVID 19 pandemic and lock down on children and adolescents.

2.14. Health system and policy makers

It has been recognized by the world that the traditional pre-COVID-19 models and policies for children and adolescents' mental health are no longer applicable during COVID 19 era. Hence, the need is felt for the transformation of policies that can take into account not only lock down duration but also times following the lockdown. The following recommendations may be useful for guiding the functioning of the health system and policy making related to mental health care of children and adolescents :

1. The focus of the health care system should be prevention, promotion, and treatment according to the **public mental health system** to meet population- mental health needs of the general population at large.
2. No single umbrella policy would be able to take into account various mental health aspects of children and adolescents dwelling in different environments. Hence the health system and policies should be based on **contextual parameters** that are different for each country or region depending on the degree of infection and the phase of infection they are in.
3. Since there is a dearth of mental health care workers in most developing countries. There is a need for **inclusive approaches** in which health care workers e.g. pediatricians, general physicians, schools, non-governmental organizations sectors are involved. Moreover, brief basic mental health care training for these arms should be planned.
4. Separate rules for the rural, suburban, and concrete domiciles in growing countries spotting the variance among college districts, which includes city, suburban, and rural districts.
5. It is critically important to develop **flexible strategies** that can be revised and adapted to school and throughout the community and done with close communication with state and/or local public health authorities.
6. Policies should be formulated taking into account the **developmental stage of the child** e.g. preschoolers, school age, adolescents.
7. There is a need for full translation dominant therapy approaches to **telehealth compatibility**, but clear rules and regulations regarding the same are mandatory.
8. It should be ensured that the vulnerable sections of the society

(medically prone, underprivileged, having developmental challenges, or having disabilities) are not neglected.

9. The **school re-entry policies** should be defined considering strict implementation of key principles of social distancing and hygiene. This should be done keeping in mind the importance of in-person learning for children in the school set up.
10. Ensure adequate **fund allocation** and proper monitoring and utilization of the funds for policy implementation.

2.15. Critical appraisal of the studies included

The studies included in the review were collected after setting criteria to have a comprehensive view of the global vision in managing the crisis of children in the COVID-19 pandemic. The majority of the studies included in the review were based on online self-reports (Bhat et al., 2020; Jiao et al., 2020; Oosterhoff et al., 2020b). The adults and older children were the respondents of the study (Lee, 2020; Liu et al., 2020; Viner et al., 2020b; Wang et al., 2020). The studies are mainly carried out in the developed nations and the East Asian countries. Studies have reported the concerns may not be generalizable throughout the globe. There are variations in the number of samples as well, thus they make it difficult to generalize the findings of their study alone.

The cross sectional studies are useful in understanding the immediate or short term impact apparent at a certain point of time. However the limitations of these cross sectional studies are that these studies cannot conclude about the long term impact of COVID-19, given that certain pre-existing vulnerabilities, high risk factors and stressors could be multiple, ongoing or recurrent and also the manner through which they work may vary. Consequently, there is a pressing need for carrying out longitudinal and developmental studies to be able to apprehend multiple layers of dynamic determinants playing role during this time of global crisis (Holmes et al., 2020). The literature suggests the need for evidence based elaborative strategies and plan of action to cater to the mental health needs of children and adolescents during the period of pandemic (Wade et al., 2020).

3. Limitations

The review articles for this review have been selected during the time of global lockdown, where the issues and challenges were new and the global crisis was at peak times. In our review, we were unable to track the measures of management targeted towards the children. The strategies reported in the studies were isolated to geopolitical conditions. The recommendations provided in this review can be modified to suit the needs of the places according to their local resources and geopolitical scenarios. Due to strict selection criteria and the short period of data collection and the only use of electronic databases for our research, there is a possibility of missing studies relevant to the care of children and adolescents.

4. Conclusion

Although the rate of COVID-19 infection among young children and adolescents is low, the stress confronted by them poses their condition as highly vulnerable. Many cross-sectional studies have been conducted to analyze the impact of COVID-19 and lock down on children and youth. The results of these studies show that the nature and extent of this impact depend on several vulnerability factors such as the developmental age, educational status, pre-existing mental health condition, being economically underprivileged or being quarantined due to infection /fear of infection. Studies show that young children show more clinginess, disturbed sleep, nightmares, poor appetite, inattentiveness, and significant separation problems.

The containment measures like school and activity centers closures for long periods together expose the children and youth to the debilitating effects on educational, psychological, and developmental

attainment as they experience loneliness, anxiety, and uncertainty. Compulsive use of internet gaming and social media puts them at higher risk. Children and adolescents with mental health conditions are not used to variation in the environment. Hence there could be an exacerbation in symptoms and behavioral problems.

The children who receive training, therapy, and other treatments are at high risk of being derailed from therapy and special educations. Economically underprivileged children are particularly prone to exploitation and abuse. Children quarantined are at high risk for developing higher risk for mental health-related challenges.

There is a need to ameliorate children and adolescent's access to mental health services by using both face to face as well as digital platforms. For this collaborative network of parents, psychiatrists, psychologists, pediatricians, community volunteers, and NGOs are required. There is a need for 'tele mental health compatibility' and be accessible to the public at large. This would be crucial to prevent during and post-pandemic mental challenges in the most vulnerable and underprivileged section of the society. The focal point of the health care system and policymaking should be prevention, promotion, and interventions corresponding to the public mental health system to meet the mental health needs of the population at large by taking the regional contextual parameters into account.

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Shweta Singh: Writing - review & editing, Software, Validation, Supervision, Data curation, Writing - original draft, Conceptualization, Methodology. **Deblina Roy:** Validation, Visualization, Investigation, Data curation, Writing - original draft, Software. **Krittika Sinha:** Visualization, Investigation, Data curation, Writing - original draft. **Sheeba Parveen:** Visualization, Investigation. **Ginni Sharma:** Visualization, Investigation, Data curation, Writing - original draft. **Gunjan Joshi:** Visualization, Investigation, Data curation, Writing - original draft.

Declaration of Competing Interest

There is no known conflict of interest. The authors whose names are listed below certify that they have no affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants, participation in speakers' bureaus arrangements, consultancies, memberships, stock ownerships, or other equity interest, or expert testimony and patent licencing arrangements) or non financial interests such as (personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript. All the authors confirm that, all of them has contributed in the conception of design; analysis, interpretation of data; drafting the article; critically revisiting the article for important intellectual inputs; and approval of the final version. This paper has not been submitted elsewhere or is under review at another journal or publishing venue. The authors have no affiliation with any organization, with a direct or indirect financial interest in the subject matter discussed in the manuscript.

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