



IMPACT OF COVID 19 LOCKDOWN ON CHILD HEALTH AND BEHAVIOUR

Paediatrics

Dr Kiran Rajesh	Department of Paediatrics, B.J. Medical College and Sassoon General Hospital, Pune, Maharashtra, India.
Dr Rahul Dawre*	Department of Paediatrics, B.J. Medical College and Sassoon General Hospital, Pune, Maharashtra, India. *Corresponding Author
Dr Aarti Kinikar	Department of Paediatrics, B.J. Medical College and Sassoon General Hospital, Pune, Maharashtra, India.
Dr Chhaya Valvi	Department of Paediatrics, B.J. Medical College and Sassoon General Hospital, Pune, Maharashtra, India.
Dr Uday Rajput	Department of Paediatrics, B.J. Medical College and Sassoon General Hospital, Pune, Maharashtra, India.

ABSTRACT

Background: Lockdown was imposed in various countries in response to the COVID 19 pandemic. While the deleterious effects of prolonged social isolation in adults is well understood, further studies are required to gauge its effect on children, their responses to the prevailing circumstances and its effects on both physical and mental health. This study aims to analyse the impact on health and behaviour of children following the imposition of lockdown.

Methods: Parents of 88 children in the age group of 1 to 12 years underwent an online survey regarding eating, sleeping habits, screen time and other activities before and during lockdown. Parents were also asked regarding any behavioural problems before and during lockdown.

Results: Screen time in children has increased following the imposition of lockdown. 30% children watched TV for more than 4 hours a day. Mobile phone usage has increased exponentially with all children of the study using mobile phones during lockdown as compared to 46% of children of the study using it before lockdown. 63% of children were reported to have more temper tantrums than usual. 67% of children indulged in more mischief and 63% were more tearful than usual.

Conclusion: The increased screen time is worrying, as this habit has immediate as well as long term consequences. Disturbances in sleep seen as prolonged sleep latency, behavioural changes are closely associated with increased screen time as seen in various studies as in this one. Apart from contributing to the increasing burden of metabolic syndrome in these children, this has also raised ophthalmologic and psychiatric concerns. These issues should be anticipated, its manifestations should be closely monitored and interventions should be instituted. Parents should be sensitised regarding these issues and be advised to keep a close watch on the activities of the children.

KEYWORDS

Lockdown, Child Health, Behaviour.

INTRODUCTION:

Coronavirus disease or COVID 19 was first identified in Wuhan, China following an outbreak of respiratory infections. The disease manifestations range from asymptomatic infection to life threatening Acute Respiratory Distress Syndrome and Multi System Inflammatory Disease. The disease has affected over 175 million people all over the world so far with 3.7 million deaths with a mortality rate of 2.11% (June 10, 2021)[1]. The mortality rate varies among groups with mortality increasing among individuals over 40 years of age. Many of the COVID deaths had a pre existing cardiovascular disease or diabetes or hypertension.

As the outbreak assumed the proportions of a pandemic, governments all over the world introduced measures to contain the pandemic. Measures like restricting movements of civilians, suspending all non essential services, restricting the number of people attending gatherings, closure of public places like schools, colleges, religious places collectively termed as lockdown were imposed. The aim of these measures was to break the chain of transmission and to organise resources to fight the pandemic.

These measures have caused social isolation, bringing with it many repercussions on mental as well as physical health. Child health has more aspects to it than adult mental health. Mental health problems are seen as difficulties in psychological and emotional development, social relationships and behaviour. Behavioural changes imbibed by them at the time of lockdown can have many long term consequences. This study aims to analyse the impact of the lockdown on child health and behaviour and subsequently provide insights regarding long term effects of such behavioural patterns and interventions to be considered if a lockdown would be re-imposed in the face of subsequent waves of this disease or other diseases.

METHODS:

A cross sectional observational study was conducted after receiving

permission from the Institutional Ethical Committee. 88 children residing in Pune were enrolled in this study. Informed consent for participating in the study was taken from each child's parents. The children were divided according to their age groups as Toddlers (1-3 years), Preschoolers (3-5 years) School going (6- 12 years). Data was collected with the help of online surveys. The link of Google form was forwarded to the participating children's parents. The following data were recorded- sleep time, screen time, eating habits, other activities before and after lockdown, the presence of behavioural problems like irritability and temper tantrums.

Statistical analysis were carried out using Comparison of proportions test. Statistical significance level was set at 0.05.

RESULTS:

Out of 88 children 47 were Male and 41 were Female. 10 were toddlers, 20 were preschoolers, 58 were school going children. The children were of Upper middle and middle class families by Modified Kuppuswamy Classification. 25% of parents were healthcare workers, 15% were government employees, 33% worked in the private sector and 26% were housewives. 52 were single child, 36 had siblings.

62% of children spent 3 hours or less playing various kinds of games during lockdown with outdoor games being the most common activity. Significant increase was seen in the time spent playing by children with children spending 3 hours or more playing games during lockdown ($p < 0.0001$). While 6% of total children played games for more than 6 hours before lockdown, this figure jumped up to 31% during lockdown.

Before lockdown children preferred outdoor games, after the enforcement of lockdown more children began playing video games and board games. After imposition of lockdown, the number of children playing with their siblings have increased nearly two fold with 34% playing with siblings before lockdown and 60% playing with their siblings during lockdown.

There is an increase in night time sleep, some more than 12 hours with more children going to bed later than usual. There is no difference in the sleep patterns of day time sleep or its duration.

Screen time of all gadgets (Television, computers, Mobile phones) had increased during lockdown compared to before lockdown. 85% of the children watched television before lockdown, which remained unchanged during lockdown. However while television viewing time was less than 2 hours before lockdown, 30% children watched television programmes for 4 hours or more during lockdown. While 54% of children did not use mobile phones with the use of less than 2 hours, there is a significant increase in the number of children using mobile phones with usage exceeding 2 hours. There is no significant difference in use of screen time for games and cartoon before and during lockdown.

The time spent on reading activities have also increased as children spent about 1 to 3 hours during lockdown compared to < 1 hour before lockdown, mostly preferring to read story books than their course books.

Activities to maintain hygiene like daily brushing, dressing remained more or less the same in frequency while a huge increase in number of children washing hands before meals was seen- a behaviour probably enforced during the pandemic.

Probably reflecting the lack of availability of certain food items were the changes in food habits. Consumption of fast food and fruits were drastically reduced during lockdown, the diet of children chiefly consisted of homemade food.

Significant changes were seen in the behaviour of children during lockdown. 63% of children were reported to have more temper tantrums than usual. 67% of children indulged in more mischief than usual and 63% were more tearful than usual. These behavioural changes can be linked to the restriction of usual outdoor activities and social activities and the sudden disruption of daily routine.

Table 1: Comparison of gaming activity before and during lockdown.

Games/Play Parameters		Before Lockdown		During Lockdown		P
		Frequency	Proportion	Frequency	Proportion	
Time spent playing	< 1Hr	10.00	11.36	0.00	0.00	0.001
	>1-3 Hrs	45.00	51.14	0.00	0.00	<0.0001
	> 3 Hrs-6 Hrs	27.00	30.68	60.00	68.18	<0.0001
	> 6 Hrs	6.00	6.82	28.00	31.82	<0.0001
Type of games	Games which require physical activity	84.00	95.45	84.00	95.45	1
	Board Games	0.00	0.00	3.00	3.41	0.079
	Sibling	30.00	34.09	53.00	60.23	0.0005
	Video Games	11.00	12.50	14.00	15.91	0.518

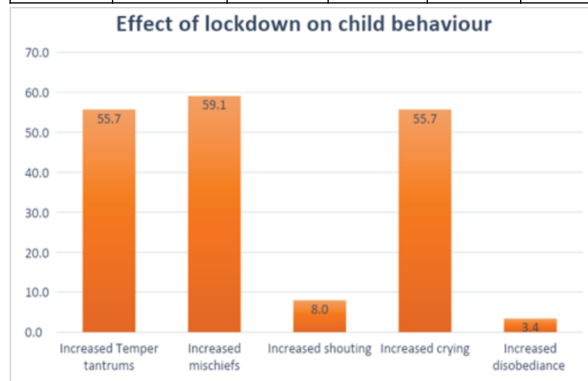
Table 2: Comparison of screen view pattern before and during lockdown.

SCREEN TIME parameters		Before Lockdown		During Lockdown		P
		Frequency	Proportion	Frequency	Proportion	
TELEVISION	Does not watch	13.00	14.77	13.00	14.77	1
	< 2 hours	75.00	85.23	48.00	54.55	<0.0001
	Between 2 to 4 hours	0.00	0.00	0.00	0.00	0
	Between 4 to 6 hours	0.00	0.00	23.00	26.14	<0.0001
	Between 6 to 9 hours	0.00	0.00	4.00	4.55	0.0435
MOBILE	Does not watch	48.00	54.55	0.00	0.00	<0.0001
	< 2 Hrs	2.00	2.27	67.00	76.14	<0.0001
	Between 2 Hrs upto 4 Hrs	28.00	31.82	9.00	10.23	0.0005

LAPTOP/ COMPUTER/ TABLET	Does not use	52.00	59.09	52.00	59.09	1
	<2 Hrs	7.00	7.95	7.00	7.95	1
SCREEN TIME MOSTLY USED FOR	Games	80.00	90.91	80.00	90.91	1
	Cartoons	83.00	94.32	83.00	94.32	1
	Movies	0.00	0.00	4.00	4.55	0.0435

Table 3: Comparison of food habits before and during lockdown.

Food Preference	Before Lockdown		During Lockdown		P
	Frequency	Proportion	Frequency	Proportion	
Home Diet	88	100.00	88	100.00	1
Fast Food	36	40.91	0	0.00	<0.0001
Wafers	20	22.73	14	15.91	0.2532
Fruits	36	40.91	11	12.50	<0.0001



Graph 1: Effect of lockdown on Child Behaviour.

DISCUSSION:

The most palpable effect of lockdown on child behaviour has observed to be on the screen time of children with a huge leap in the number of children watching television and mobile phones as well as increased duration of the same. This can be attributed to boredom due to restricted activities enforced by the lockdown. This is however a cause of concern as per a study conducted by Guerrero et al which has found that increased screen time is associated with problematic behaviour and reduced sleep duration and quality while increased duration of video game play are linked to social withdrawal, social isolation and internalising problems. [2] This is in line with the observations of this study which has reported increased temper tantrums and mischief in children. Prolonged screen time also affects the eyes manifesting as eye discomfort, blurred vision, headaches, dry eyes. [3] A study conducted by Mohan A. Et al observed that symptoms of digital eye strain is prevalent in approximately 50% of children attending online classes. [4]

With closure of schools, educational establishments have taken to online teaching in order to circumvent the interruption in education. This automatically prolongs screen time which has already exceeded recommended time during the pandemic. While this is unavoidable, it points towards the need for supervision and monitoring of screen times. The time for video games and television should be restricted with overseeing of the nature and content of the same. When playing games or watching videos the child should be encouraged to take breaks of atleast twenty seconds every twenty minutes. The rooms should be well illuminated and the screen should be atleast 18 to 24 inches away.

The consumption of fast food was much lower during the lockdown as compared before lockdown while home made food made up the diet of the children during lockdown. This can be attributed to the reduced availability of fast food during lockdown. This may also have contributed to the increased temper tantrums and crying in children.

This study has observed that there is an increase in the duration of nocturnal sleep in children with delay of bedtime, similar to that of the study conducted in Italy by Bruni et al. [5] Delayed bedtime can be attributed to increased screen time- blue light emitted from television and smartphone screens is known to delay onset of sleep. [6] Lights of short wavelengths inhibit melatonin secretion, altering the circadian rhythm and prolonging sleep onset; explaining the increase in sleep onset in the subjects of this study. [7]

The behavioural changes in children seen as increased temper tantrums and tearfulness due to anxiety and the alteration in diet and sleeping pattern are in close agreement with the study of child behaviour during lockdown conducted in Punjab, India.[8]. A meta- analysis conducted by the Paediatric Neurology Division of AIIMS, Rishikesh estimates an overall worsening of behaviour in 79% of subjects.[9]. Similar findings were seen in studies conducted in China[10] and Bangladesh[11]

Lockdown has been a period of uncertainty and anxiety. The deleterious effects of prolonged social isolation on adults and children have been well documented. Adding to that is the economic instability seen due to closing of various commercial establishments, further affecting the mental health of the people.

Children are just as susceptible to the effects of social isolation. Increased boredom is seen as increased screen time while anxiety seen in the subjects of this study is seen as temper tantrums and increased tearfulness. Boredom is attributed to the lack of outdoor games and social interaction during the lockdown. The fear of the pandemic, disruption of daily routines, general confusion and uncertainty has lead to anxiety. Worries regarding education, being away from schools, academic pressure and uncertainty regarding careers have compounded the problem of anxiety. Older children are more susceptible due to the relatively higher use of social media by this age group.

The mental health of children is also heavily influenced by family circumstances. Due to the closure of most establishments during the lockdown, many people have lost their jobs. This economic uncertainty becomes a source of worry for the parents which spill over to the children. On the other hand frontline workers face stressful situations and are absent from home for a comparatively longer time. The children of such parents also suffer due to the restricted interaction with parents.

The habits and lifestyle changes enforced by the lockdown will have far reaching consequences on the physical and mental health of children. The increased screen times along with the disturbed patterns of sleep disrupt the circadian rhythm bringing along with it problems like obesity, Type II diabetes. [14] Circadian rhythm disruption due to any reason increases the risk of Major Depressive Disorder, Bipolar Disorder.[15]

These findings point towards the need for collaboration of psychologists, paediatricians and community health practitioners to address this problem. Psychological counselling of family members as well as children can be done telephonically or by video calls without the risk of infection. Digital technology can help young children in modifying their behaviour in order to reduce the impact of lockdown induced mental dysfunction. Self help interventions like bibliotherapy and computerised therapy can also help. Further research in this area will help formulate policies and plan interventions while planning further lockdowns in the event of a third wave or another pandemic.

REFERENCES:

- 1 WHO Coronavirus Disease Dashboard.
- 2 Guererro M.D., Barnes J., Chaput J.P., Tremblay M.S. Screen Time and Problem Behaviours in Children: Exploring the Mediating Role of Sleep Duration. *Int J Behav Nutr Phys Act* 16, 105 (2019).
- 3 Kozeis N. Impact of Computer Use on Children's Vision. *Hippokratia*. 2009; 13(4):230-231.
- 4 Mohan A., Sen P., Shah C., Jain E., Jain S. Prevalence and Risk Factor Assessment of Digital Eye Strain among Children using Online E Learning during COVID 19 Pandemic: Digital Eye Strain among Kids. (DESK Study- 1). *Indian J Ophthalmol*. 2021 January; 69(1): 140- 144.
- 5 Bruni O., Malorgio E., Doria M., Finotti E., Melegari M.G., Villa M.P., Ferri R. Changes in Sleep Patterns and Disturbances in Children and Adolescents in Italy during the COVID 19 Outbreak. *Sleep Med* 2021 February 9. Doi: 10.1016/j.sleep.2021.02.003
- 6 LeBourgeois M.K., Hale L., Chang A.M., Akacem L.D., Montgomery- Downs M.E., Buxton O.M. Digital Media and Sleep in Childhood and Adolescence. *Pediatrics* November 2017; 140(2)92-96.
- 7 Chang A.M., Aeschbach D., Duffy J.F., Czeisler C.A. Evening Use of Light Emitting eReaders negatively affects sleep, Circadian Rhythm and Next Morning Alertness. *Proc Natl Acad Sci USA* 2015; 112(4): 1232- 1237.
- 8 Sama B.K., Kaur P., Thind P.S., Verma M.K., Kaur M., Singh D.D. Implications of COVID 19 imposed lockdown on children's behaviour in Punjab, India. *Childcare Health Development* 2021;47:128-135.
- 9 Panda P.P., Gupta J., Roy Chowdhury S., Kumar R., Meena A.K., Madaan P., Sharawat I.K., Gulati S. Psychological and Behavioural Impact of Lockdown and Quarantine Measures for COVID 19 Pandemic on Children, Adolescents and Caregivers: A Systematic Review and Meta-Analysis. *Journal of Tropical Paediatrics* 2020, 00, 1-13.
- 10 Li Duan, Xiaojun Shao, Yuan Wang, Yingling Huang, Junxiao Miao, Xueping Yang, Gang Zhu. An investigation of mental health status of children and adolescents in China during the outbreak of COVID 19, *Journal of Affective Disorders* 2020.
- 11 Yeasmin S., Banik R., Hussain S., Hossain M.N., Mahmud R., Salma N., Hossain M.M.

- Impact of COVID 19 Pandemic on the Mental Health of Children in Bangladesh: A cross sectional study. *Children and Youth Services Review* 117 (2020) 105277.
- 12 Loades M.E., Chatburn E., Higson- Sweeney N., Reynolds S., Shafran R., Brigden A., Linney C., McManus M.N., Borwick C., Crawley E. Rapid Systematic Review: The Impact of Social Isolation and Loneliness on the Mental Health of Children and Adolescents in the Context of COVID 19. *Journal of the American Academy of Child and Adolescent Psychiatry*. November 2020 59;11.
- 13 Miller R., Quinn N., Cameron J., Colson A (2020). Considering the Evidence of the Impacts of Lockdown on the Mental Health and Wellbeing of Children and Young People within the Context of the Individual, the Family and Education. *Glasgow Mental Health Foundation*.
- 14 Srivastava G., O'Hara V., Browne N. Sleep Disturbance as a Contributor to Pediatric Obesity: Implications and Screening. *J. Sleep Disord Manag* 2018, 4:019
- 15 Walker W.H., Walton J.C., DeVries A.C., et al. Circadian Rhythm Disruption and Mental Health. *Transl Psychiatry* 10, 28(2020).