Original Research Paper

Nursing

PHYSICAL AND SOCIO-COGNITIVE DEVELOPMENT OF PRESCHOOL CHILDREN DURING COVID 19 PANDEMIC: A PILOT STUDY

Mrs. Rekharani Singh

PhD Scholar, Shri JJT University, Jhunjhunu Rajasthan

ABSTRACT **Background:** Normally preschool phase is the time to prepare the children for schooling. The phase emphasizes separation individuation of the child from the primary caregiver and social skill training like learning to mix, talk, share and play with other children. The COVID-19 pandemic has brought these activities to absolute standstill in last two years. Naturally, the children today even with lockdown lifted and school opened offline are poorly prepared for the schooling. **Objectives:** To estimate the impact of Covid 19 pandemic on the growth parameters and to evaluate the impact of Covid 19 pandemic on socio-cognitive development of preschool children. **Methods:** Cross sectional study, **Population:** Preschool Children of both genders, **Sample Size:** 30, **Sampling:** Convenient Sampling, **Material:** Developmental Tasks Inventory for pre-schoolers developed by the investigator and found reliable (r=0.78) **Results:** The participants from 2 to 5 years, had 46.67% males and 53.33% females. Mean height of the preschool children was less than the standard height by 2 to 5 cm. and mean weight was less by 2 to 3 kg. Socio-cognitive development of the 2 year and 3 years old preschool children was found less than 50% of expected whereas the socio-cognitive development of 4 years old pre-schoolers was found just around 50%. For pre-schoolers of 5 years the socio-cognitive development was around 66% of the expected for the age. **Conclusion:** During Covid 19 pandemic the physical and socio-cognitive development of the preschool was negatively influenced. Parents and the preschool institutes need to be more proactive in ensuring the normal physical growth and socio-cognitive development of these children before they enter the schooling. It would be interesting to study the scholastic performance of these children and their achievements in relation to work and job placements after completing education.

KEYWORDS : Physical growth, socio-cognitive development, pre-schooler

INTRODUCTION

Many children do not develop optimally in their early formative years as a result of exposure to multiple contextual risk factors. It is being increasingly realized that early identification of developmental problems and corrective remedial action are among the most cost-effective interventions in the field of preventive child health. In a developing country like India, the high prevalence of under-nutrition, iodine deficiency, iron deficiency, and inadequate cognitive stimulation are important risk factors for sub-optimal development. Yet, health care providers at the primary level are mostly unaware of the importance of the timely acquisition of developmental milestones by children under their care. This is especially true for children belonging to the disadvantaged sections of society. If such developmental problems are prevalent and there is a significant delay in the acquisition of competencies by children, then a strong case can be made for introducing the concept of developmental surveillance in primary health care, as is done for physical growth for millions of young children in India.[1,2] Early childhood development is key to achieving the Sustainable Development Goals and can be negatively influenced by many different adversities including violence in the home, neglect, abuse and parental ill-health.[3]

Background Of The Study

Preschool children are lacking those social interactions that they would have normally got from people outside their homes. They are also lacking most deserved play time with other children.[4,5]

Pediatricians are noting developmental delays as well as potential for long-term health consequences, particularly for children from low-income households during COVID 19 pandemic. While Covid-19 is typically benign in children, the pandemic could have long-lasting impacts on society's youngest members. With childcare programs closed and social distancing measures in place, many children are missing out on opportunities for development.[5]

''Children are not getting the cognitive and social stimulation that they would normally get outside their home,'' said Dr. Michelle Aguilar, the head of Pediatrics at Venice Family Clinic in Los Angeles, California. Providers have noted delays in speech and language as well as trouble sharing and being in groups.[5]

During the pandemic, housing and food insecurity have skyrocketed, at the same time as rates of domestic abuse and neglect have increased. These kinds of stressful events, referred to as adverse childhood experiences, can have long-term consequences.[6]

Families have had to separate when a caregiver or a family member becomes ill. They had to separate for some time to stay with other family members in order to prevent themselves from contacting the infection. Children had to move into multi-generational homes that were more crowded.[7]

Normally, a child at four or five-year is enrolled in school. But the children of this age are to start a little bit further behind in terms of that key foundational academic knowledge or those kind of social, emotional skills. The pre-schoolers will have more catch up to do.[8]

A systematic review of studies that examined the impact of epidemics or social restriction on mental and developmental health in parents and children/adolescents. The findings suggest the delay in the development and physical growth of the adolescents and children.[9]

A population-based study in rural India followed up mothers and their infants through pregnancy and the first 18 months of life. The authors found that most children faced one or more adversity and nearly 50% faced four or more of these potential impediments to wellbeing. The key finding was that each extra increase in childhood adversity was associated with both poorer growth and also poorer development measured at 18 months, a crucial time for optimal brain development and a key predictor of future health and wellbeing.[10]

Geographical influences, nutrition and socio-economic status of the family are among the key predictors of growth and development of the children in early life.[11] Current Corona

pandemic has shattered the stability of these factors very badly for most families.

Need Of The Study

Many studies describe several potential mental and emotional consequences of epidemics such as COVID-19, H1N1, AIDS, and Ebola: severe anxiety or depression among parents and acute stress disorder, post-traumatic stress, anxiety disorders, and depression among children. These data can be related to adverse childhood experiences and elevated risk of toxic stress. The more adverse experiences, the greater the risk of developmental delays and health problems in adulthood, such as cognitive impairment, substance abuse, depression, and non-communicable diseases.[7]

The physical growth of young children in low- and middle-income countries is reduced compared to international standards. The deviations in growth in both weight and height are greatest in the first 2 years of life and this has serious consequences for child mortality, development, adult stature, and health.[12]

The investigator felt the need to conduct present study as there is normal deviation from the standard growth and development parameters in India being a developing country and catering to the wide variety of population from different socio-economic strata. Also, the investigators believes that the pandemic situations and early life adversities influence the children of different age groups differently.

Objectives Of The Study:

1. To estimate the impact of Covid 19 pandemic on the growth parameters.
2. To evaluate the impact of Covid 19 pandemic on socio-cognitive development of preschool children.

MATERIAL & METHODS:

Study setting: Home setting of the children
Study Design: Cross sectional study,
Population: Preschool Children of both genders,
Sample Size: 30,
Sampling: Convenient Sampling,

Material:

Developmental Tasks Inventory for pre-schoolers developed by the investigator and found reliable (r=0.78). The inventory has two parts. Part I has 12 items for demographic information. Part II consists of 27 items for 2 years old child divided into 4 domains of socio-cognitive development namely: social, language, cognitive development and physical growth. There are 30 items for the 3 years old child, 25 items each for the 4 and 5 years old child. The responses of parents and child's actions are marked as 'not able to perform' - 0, 'is able to perform'-1, 'parent knows about the child's performance' - 2 and 'performed for the first time in front of the data collector' - 1.

RESULTS:

The the distributions of study participants according to their demographic characteristics. It shows that 33.33% each of participants belonged to age group 2 years and 3 years and 16.67 each belonged to 4 years and 5 years. Males were 46.67% and females were 53.33%. Majority (56.67%) of the parents of the participants were educated up to secondary school level and 16.67% were graduate. The main occupation of the study participants parents was labourer (36.67%), followed by (23.33%) businessmen, 20% having professional practice and 10% having government job. Nobody was jobless. Majority (46.67%) had 2 children in the family and 43.33% had one child in the family. Majority (76.67%) of the families had 3-5 family members. Majority (43.33%) belonged

to Hindu religion and all them resided in the rural areas. 66.66% of the children in the study were enrolled in balwadi/nursery or anganwadi. 83.33% had family history of COVID 19 infection. (Table – 1)

Table 1: Description of population according to their demographic characteristics

S. N.	Demographic Characteristics	Categories	Frequency	%
1	Age of the child	a) 2	10	33.33
		b) 3	10	33.33
		c) 4	5	16.67
		d) 5	5	16.67
2	Gender	a) Male	14	46.67
		b) Female	16	53.33
3	Parent Education	a) Illiterate	8	26.67
		b) High School	17	56.67
		c) Graduate	5	16.67
		d) Post Graduate	0	0.00
4	Parent's Profession	a) Jobless	0	0.00
		b) Labour	11	36.67
		c) Business	4	13.33
		d) Private Job	7	23.33
		e) Govt Job	3	10.00
		f) Professional	6	20.00
5	No. of Children	a) 1	13	43.33
		b) 2	14	46.67
		c) 3	3	10.00
		d) More than 3	0	0.00
6	Total No. of Family Members	a) 3 - 5	23	76.67
		b) 6 - 8	7	23.33
		c) 9 - 11	0	0.00
		d) More than 11	0	0.00
7	Religion	a) Hindu	13	43.33
		b) Muslim	5	16.67
		c) Christian	0	0.00
		d) Buddhist	6	20.00
		e) Others	6	20.00
8	Residence	a) Urban	0	0.00
		b) Slum	0	0.00
		c) Rural	30	100.0
9	Child Education	a) None	10	33.33
		b) Anganwadi	13	43.33
		c) Balwadi/ Nursery	7	23.33
		d) School	0	0.00
10	H/o. Covid in the family	a) Yes	25	83.33
		b) No	5	16.67

The mean height of 2 years old children was 79.40 ± 6.24 cm (Std. 85.5 cm), and the mean weight was 9.10 ± 1.20 kg. (std. 12 kg.) The mean height of 3 years old children was 91.20 ± 3.88 cm (std. 94 cm), and the mean weight was 12.50 ± 0.85 kg (Std. 14.2 kg). The mean height of 4 years old children was 100.20 ± 3.03 cm (Std. 100.3 cm), and the mean weight was 13.80 ± 1.10 kg (Std. 15.4 kg). The mean height of 5 years old children was 105.40 ± 8.08 cm (Std. 107.9 cm), and the mean weight was 15.40 ± 0.55 kg (Std. 17.9 kg). (Table - 2)

Table 2: Growth parameters of the study population

Age in Years	Std. Height cm	Height Mean cm	Height SD cm	Std. Weight Kg.	Weight Mean Kg.	Weight SD Kg.
2	85.5	79.40	6.24	12.0	9.10	1.20
3	94	91.20	3.88	14.2	12.50	0.85
4	100.3	100.20	3.03	15.4	13.80	1.10
5	107.9	105.40	8.08	17.9	15.40	0.55

The developmental parameters reveals that at the age of 2 years the social and emotional development was 45%, the language and communication skills development was 40%, the Cognitive developments was 39.38% and the physical development was 37.86%. At the age of 3 years the social and emotional development was 53%, the language and communication skills development was 55.63%, the Cognitive developments was 38.75% and the physical development was 50%. At the age of 4 years the social and emotional development was 64.29%, the language and communication skills development was 58%, the Cognitive developments was 43% and the physical development was 56.67%. At the age of 5 years the social and emotional development was 69%, the language and communication skills development was 60%, the Cognitive developments was 60% and the physical development was 53.33%. (Table – 3)

Table 3: Developmental Milestones of the study population

Sr. No.	Domain of Development	Age in Years	Freq.	Max. Score	Score Obtd.	% of Score
Q1A	Social And Emotional	2	10	100	45	45.00
Q1B	Language/Communication			140	56	40.00
Q1C	Cognitive (Learning, Thinking, Problem-Solving)			160	63	39.38
Q1D	Movement/Physical Development			140	53	37.86
Q2A	Social And Emotional	3	10	200	106	53.00
Q2B	Language/Communication			160	89	55.63
Q2C	Cognitive (Learning, Thinking, Problem-Solving)			160	62	38.75
Q2D	Movement/Physical Development			80	40	50.00
Q3A	Social And Emotional	4	5	70	45	64.29
Q3B	Language/Communication			50	29	58.00
Q3C	Cognitive (Learning, Thinking, Problem-Solving)			100	43	43.00
Q3D	Movement/Physical Development			30	17	56.67
Q4A	Social And Emotional	5	5	100	69	69.00
Q4B	Language/Communication			40	24	60.00
Q4C	Cognitive (Learning, Thinking, Problem-Solving)			50	30	60.00
Q4D	Movement/Physical Development			60	32	53.33

At the age of 2 years the relationship between height and development has non-significant and weak positive relationship with development (r=0.285; p>0.05). At the age of 3 years the relationship between height and development has non-significant and weak negative relationship with development (r= -0.080; p>0.05).

At the age of 4 years the relationship between height and development has non-significant and weak positive relationship with development (r=0.359; p>0.05). At the age of 5 years the relationship between height and development has non-significant yet strong positive relationship with development (r=0.872; p>0.05) at 5% level of significance. (Table – 4)

Table 4: Relationship between Height and Development of study participants

Study Variables	Age	Freq	Mean	SD	'r'	'p'
Weight	2	10	79.40	6.24	0.285	0.425
Development			21.70	3.02		NS, p>0.05
Weight	3	10	91.20	3.88	-0.080	0.825
Development			29.70	3.06		NS, p>0.05
Weight	4	5	1.00	3.03	0.359	0.553
Development			26.80	5.72		NS, p>0.05
Weight	5	5	1.05	8.08	0.872	0.054
Development			31.00	4.69		NS, p>0.05

At the age of 2 years the relationship between weight and development has non-significant and weak positive relationship with development (r=0.260; p>0.05). At the age of 3 years the relationship between weight and development has non-significant and weak positive relationship with development (r= 0.341; p>0.05). At the age of 4 years the relationship between weight and development has non-significant and weak negative relationship with development (r= -0.344; p>0.05). At the age of 5 years the relationship between weight and development has non-significant and negative relationship with development (r= - 0.296; p>0.05) at 5% level of significance. (Table – 5)

Table 5: Relationship between Weight and Development of study participants

Study Variables	Age	Freq	Mean	SD	'r'	'p'
Height	2	10	21.70	3.02	0.260	0.469
Development			9.10	1.20		NS, p>0.05
Height	3	10	29.70	3.06	0.341	0.334
Development			12.50	0.85		NS, p>0.05
Height	4	5	26.80	5.72	-0.344	0.571
Development			13.80	1.10		NS, p>0.05
Height	5	5	31.00	4.69	-0.296	0.628
Development			15.40	0.55		NS, p>0.05

DISCUSSION:

The present study aimed at estimating the impact of Covid 19 pandemic on the growth parameters and on socio-cognitive development of preschool children. The findings of the study reveal that the growth parameters of the preschool children was found less than the expected standards for the Indian preschool population. The socio-cognitive developments of the preschool children at 2, 3 years was much below the 50% of expected socio-cognitive development. For the 4 years old children it was 50% and for the 5 years old children it was found 66%.

These findings are concurrent with the findings from following studies.

A study by Bhopal S, Roy R, Verma D, Kumar D, Avan B, Khan B, et al. (2019) titled 'Impact of adversity on early childhood growth & development in rural India: Findings from the early life stress' enrolled 1726 children soon after birth and assessed 1273 of these at both 12 and 18 months of age. There were consistent and strongly negative relationships between all measures of childhood adversity and all five child growth & development outcome measures at 18 months of age. For the Bayley motor scale, each additional adversity was associated with a 1.1 point decrease (95%CI -1.3, -0.9); for the cognitive scales this was 0.8 points (95%CI -1.0, -0.6); and for language this was 1.4 points (95%CI -1.9, -1.1). Similarly for growth, each additional adversity was associated with a -0.09 change in weight-for-age z-score (-0.11, -0.06) and -0.12 change in height-for-age z-score (-0.14, -0.09).[1]

Deepti Dabar, Ranjan Das, Seetharamaiya Nagesh, Vikas Yadav, and Abha Mangal conducted a study titled, A Community-based Study on Growth and Development of Under-Five Children in an Urbanized Village of South Delhi. The findings revealed that 10.6% of children less than 5 years old were developmentally delayed. Maximum number of children (10.1%) had a delay in the domain of 'hearing language, concept development'. Of all the factors, the strongest association was found with stunting, paternal education, alcohol abuse, attendance in anganwadi/playschool.[13]

Araújo LA, Veloso CF, Souza MC, Azevedo JM, Tarro G. studied the potential impact of the COVID-19 pandemic on child growth and development through a systematic review. The authors reported that COVID-19 pandemic has produced high morbidity and mortality rates within the global population,39 as well as risk factors for healthy growth and development among children. The increase in parental stress, the suspension of classroom activities, social isolation measures, nutritional risks, children's exposure to toxic stress, especially in previously unstructured homes, and a lack of physical activities.[7]

David C. Clark, Christopher J. Cifelli and Matthew A. Pikosky Linear reported that growth and cognitive development are particularly influenced by nutritional status in young children and deficits in nutrition during preschool years may be irreversible, resulting in failure to achieve not only physical stature but also socio-economic potential.14

CONCLUSION:

During Covid 19 pandemic the physical and socio-cognitive development of the preschool was found negatively influenced (40 to 60% of the expected standards). Lack of knowledge among parents regarding the growth and development of early childhood and COVID-19 pandemic increasing the adversities of parents having preschool children at home have contributed to the reduction in the growth parameters and socio-cognitive development of the preschool children. Community health workers need to ensure the normal physical growth and socio-cognitive development of these children before they enter the schooling by creating awareness among parents. The pre-schools should take proactive steps to bring back these children to the schools and provide adequate stimulation for their social cognitive skills development. It would be interesting to study the academic performance of these children and their achievements in relation to work and job placements after completing education.

REFERENCES:

1. Bhopal S, Roy R, Verma D, Kumar D, Avan B, Khan B, et al. (2019) Impact of adversity on early childhood growth & development in rural India: Findings from the early life stress sub-study of the SPRING cluster randomised controlled trial (SPRING-ELS). PLoS ONE 14(1): e0209122. https://doi.org/10.1371/journal.pone.0209122
2. Grantham-McGregor S, Cheung YB, Cueto S, Glewwe P, Richter L, Strupp B. Developmental potential in the first 5 years for children in developing countries. The Lancet. 2007;369: 60–70.
3. Daelmans B, Darmstadt GL, Lombardi J, Black MM, Britto PR, Lye S, et al. Early childhood development: the foundation of sustainable development. The Lancet. 2017;389: 9–11.
4. Cronholm PF, Forke CM, Wade R, Bair-Merritt MH, Davis M, Harkins-Schwarz M, et al. Adverse Childhood Experiences: Expanding the Concept of Adversity. Am J Prev Med. 2015;49: 354–361. pmid:26296440
5. Walker SP, Wachs TD, Gardner JM, Lozoff B, Wasserman GA, Pollitt E, et al. Child development: risk factors for adverse outcomes in developing countries. The Lancet. 2007;369: 145–157.
6. Catani C, Gewirtz AH, Wieling E, Schauer E, Elbert T, Neuner F. Tsunami, war, and cumulative risk in the lives of Sri Lankan schoolchildren. Child Dev. 2010;81: 1176–1191. pmid:20636689
7. Araújo LA, Veloso CF, Souza MC, Azevedo JM, Tarro G. The potential impact of the COVID-19 pandemic on child growth and development: a systematic review. J Pediatr (Rio J). 2020. https://doi.org/10.1016/j.jped.2020.08.008
8. Group WHOMGRS. WHO Child Growth Standards based on length/height, weight and age. Acta Paediatr Suppl 2006;450:76–85.
9. To T, Cadarette SM, Liu Y. Biological, social, and environmental correlates of preschool development. Child Care Health Dev 2001;27:187–200
10. National Rural health mission, Ministry of Health and Family Welfare, Government of India. Rashtriya Bal Swasthya Karyakram (RBSK) Child Health Screening and Early Intervention Services Under NRHM: Operational Guidelines. Nirman Bhavan, New Delhi: National Rural health mission, Ministry of Health and Family Welfare, Government of India, 2013.
11. World Health Organization, United Nations Children's Fund, World Bank Group. Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential [Internet]. Geneva: World Health Organization; 2018. Available: Available online: http://www.who.int/maternal_child_adolescent/child/nurturing-care-framework
12. Black RE. Patterns of Growth in Early Childhood and Infectious Disease and Nutritional Determinants. Nestle Nutr Inst Workshop Ser. 2017;87:63-72. doi: 10.1159/000448938. Epub 2017 Mar 17. PMID: 28315889.
13. Deepti Dabar, Ranjan Das, Seetharamaiya Nagesh, Vikas Yadav, and Abha Mangal conducted a study titled, A Community-based Study on Growth and Development of Under-Five Children in an Urbanized Village of South Delhi. Journal of Tropical Pediatrics, 2016, 62, 446–456 doi: 10.1093/tropej/fmw026.
14. David C. Clark, Christopher J. Cifelli and Matthew A. Pikosky. Growth and Development of Preschool Children (12–60 Months): A Review of the Effect of Dairy Intake. Nutrients 2020, 12, 3556; doi:10.3390/nu12113556.