

ASSESSMENT OF LIFESTYLE CHANGES AND THEIR EFFECT ON HEALTH AMONG CHILDREN OF ≤15 YEARS DURING COVID-19 PANDEMIC, IN NORTH INDIA

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ABSTRACT

Objective: The objectives of the study were: (1) To assess life style changes among children of ≤15 years of age during COVID-19 pandemic and (2) to find out the effect of the life style changes on health of children of ≤15 years of age.

Methods: The cross-sectional comparative study conducted at department of pediatrics, Vivekananda Polyclinic and Institute of Medical Sciences, Lucknow for duration of 1 year and sample size found to be 276 on calculation by applying the formula.

Results: Out of 278 children, about 39% (108) were female children. Most of children were studying in primary level classes (52.51%) and most of enrolled children had joint family (66.18%). Level of physical activity reduced significantly due to closure of school and restriction on outdoor activities. Weight of children increased significantly during COVID-19 pandemic seems to be due to decreased in physical activities and consumption of more fast food/fried food (high calorie intake) and sedentary life style.

Conclusion: During COVID-19 pandemic due to closure of schools and restricted outdoor activities results in decrease level of physical activities, increased consumption of high calorie food and sedentary behavior lead to increase in weight of children and changes in sleeping pattern of children.

Keywords: COVID-19, Pandemic, Children's, Physical activity, Fast/fried food.

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INTRODUCTION

First case of COVID-19 was reported in Wuhan city of china in December month of year 2019 [1]. WHO declared COVID-19 as global public health crises in March 2020 [2]. To prevent or slow down the speed of transmission of virus, government enforced lockdown, result in restriction in travelling, opening of market, industries, complete closure gyms, schools and colleges also banned social gathering and outdoor activities. As a results, routine life style of children have been changed [3]. The closures of schools and adoption of COVID-related behavior affecting the lifestyle of children [4]. Restriction in social activity to reduce the spread of COVID-19 results in decrease involvement of children in different type of physical activities [3,5,6] and adapting in sedentary lifestyle [7,8]. Physical activities and sedentary life style are important factors affecting the health of the children [9-11] Adverse effect of prolonged sedentary behavior on health reported even in those who involve on moderate to vigorous physical activities [12,13]. Excessive sedentary behavior along with inadequate level of physical activities results in adverse effect on the health of the children such as excessive weight gain (obesity/overweight) [14]. Guidelines on physical activity released by the WHO in 2020 to promote the physical and mental health of children. The WHO recommended children of age 5-17 year perform at least 60 min moderate to vigorous physical activities and restricting the sedentary behavior <2 h/day [15]. Restriction during COVID-19 pandemic encourages the people to stay at home and work from home results in changes in the dietary pattern. People have more free time thus spending more time on cooking results in overall increase in the consumption of food intake specially increase intake of sugar and fat during lockdown [16]. Some studies reported consumption of snacks and sweets increased during COVID-19 [17-19].

This study was conducted to access changes in dietary pattern, changes in level of physical activity and their effect on the children during COVID-19 pandemic.

Objective

The objectives of the study are:

1. To assess life style changes among children of ≤15 years of age during COVID-19 pandemic
2. To find out the effect of life style changes on health of children of ≤15 years.

Methods

Study area

The study was conducted by Department of Paediatrics, Vivekananda Polyclinic and Institute of Medical Sciences, Lucknow.

Study design

This was a cross-sectional comparative study.

Study duration

The study period was 12 months (November 2020–October 2021).

Sample size

Minimum 276 sample size was calculated by applying the formula

$$N = Z_{1-\alpha/2}^2 pq/d^2$$

Where

n=Sample size

$Z_{1-\alpha/2}$ =two tailed alpha error

p=Population proportion

d=Precision

$Z_{1-\alpha/2}=1.96$ at 5% alpha error

$p=23.5\%$ (0.235) [population of children below <15 years in Lucknow (U.P. India)-NFHS-5]

$q=1-p$

$d=5\%$ (0.05)

$n=(1.96)^2 * 0.235 (1-0.235) / (0.05)^2$

$n=276.249 \approx 276$

Inclusion criteria

- Children of 5–15 years of age come in OPD/IPD in Department of Paediatric of VPIMS were included in the study.

Exclusion criteria

- Not willing to participate were excluded from the study.

Validation of questionnaire (bilingual)

Before the study, a pilot study was conducted on 10 patients to validate the pre-designed questionnaire and made the changes, if necessary.

These questions were asked in relation to pre-COVID and COVID era:

- Pre-COVID era: Duration before LOCKDOWN (i.e., before March 2020) in India.
- COVID era: Duration after LOCKDOWN (i.e., after March 2020).

Study protocol

Ethical clearance and informed consent (Guardian) were taken. The study was done at Vivekananda Polyclinic and Institute of Medical Sciences, Lucknow. Minimum of 276 children ≤ 15 years attending OPD or IPD were enrolled, and pre-designed questionnaires were used to collect the information about the physical activity performed by children in a week. The question selected to assess the physical activity from questionnaire "Youth in Review Activity Profile" YAP27, used to assess various parameters in pediatric age [20]. These questions were asked to the parents of the children. Mother and father are preferred the most, followed by the closed guardian. In the above process, pre-design questionnaire (Bilingual) asks to the parents, and their response was noted/filled by the primary investigator.

RESULTS

Fig. 1 depicted the sex wise distribution of children. Mean age and standard deviation calculated for Male and female children were 8.6005, 2.755 and 8.972, 2.816, respectively.

Fig. 2 depicted, 10.43% of children studied in class LKG and UKG, 52.51%, 37.06% children studied in primary and secondary classes, respectively.

Fig. 3 depicted, 66.2% of children belonged to joint family and remaining 33.8% of children belonged to nuclear family.

Table 1 Physical activities of children affected significantly high during COVID-19 pandemic due to restriction imparted by government to prevent transmission of COVID-19 infection.

DISCUSSION

In this study, total 278 children were enrolled in OPD and IPD of institute during 1 year of study period. Out of 278 children, about 39% (108) were female and 61% (170) were male. Most of children were studying in primary level classes (52.51%) and most of enrolled children had joint family (66.18%). Table 1 showed level of physical activity reduced significantly due to closure of school and restriction on outdoor activities. About 54.68% of children did not perform any physical activities and 22.66% of children performed only 1 times/week and only little 6.83%, 2.88% performed 3 times/week and daily physical activities during COVID-19, respectively, against percentages of the children performing physical activity before COVID-19 pandemic. Similar finding reported in study of Ammar *et al.* (2020) [21] and Almandoz *et al.* [22], Where the

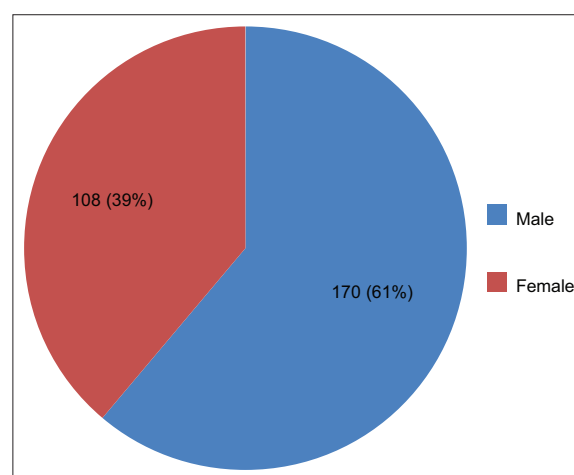


Fig. 1: Distribution of children by sex

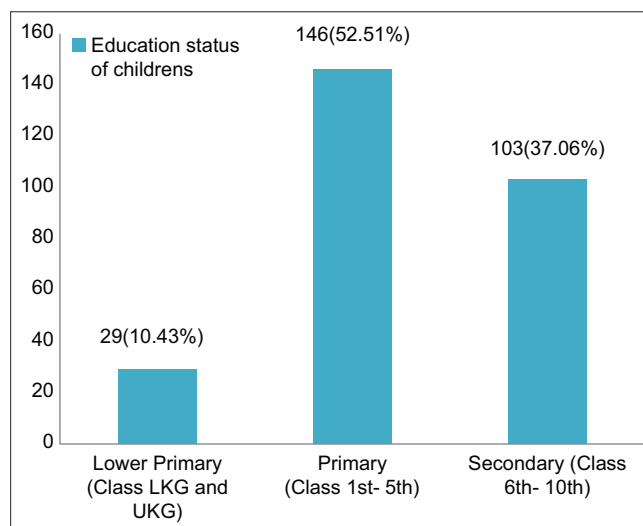


Fig. 2: Education status of children

Table 1: Changes in level of physical activity among children during COVID-19 pandemic

Free play or going for walk in neighborhood	Before COVID-19 pandemic	During COVID-19 pandemic	
Never	17 (6.11%)	152 (54.68%)	Chi-square statistics=212.85 p<0.00001 (<0.05)*
1 times/week	41 (14.75%)	63 (22.66%)	
2 times/week	63 (22.66%)	36 (12.95%)	
3 times/week	86 (30.94%)	19 (6.83%)	
Daily	71 (25.54%)	8 (2.88%)	
Total	278 (100.00%)	278 (100.00%)	

Table 2: Changes in dietary pattern among children during COVID-19 pandemic

Consumption of fast/fried food	Before COVID-19 pandemic	During COVID-19 pandemic	
Low (≤ 1 times/day)	118	73	Chi-square statistics=16.77 p=0.0002 (<0.05)
Moderate (2-3 times/days)	91	108	
High (≥ 4 times/day)	69	97	
Total	278	278	

Table 3: Changes in weight of children during COVID-19 pandemic

Information about weight given by Parents/Guardians	Before COVID-19 pandemic	During COVID-19 pandemic	
Thin/low weight	13	9	Chi-square statistics=8.026 p=0.018 (<0.05)
Normal weight	218	196	
Overweight/obese	46	73	
Total	278 (100.00%)	278 (100.00%)	

Table 4: Occurrence of constipation among children due to changes in dietary pattern during COVID-19 pandemic

Consumption of fast/fried food	Constipation/Changes in bowel habit		Total	
	Yes	No		
Low (≤ 1 times/day)	5 (7.35%)	68 (92.55%)	73 (100.00%)	Chi-square statistics=144.88 p<0.00001* (<0.05)
Moderate (2-3 times/days)	32 (29.63%)	76 (70.37%)	108 (100.00%)	
High (≥ 4 times/day)	90 (92.78%)	6 (7.22%)	97 (100.00%)	
Total	127 (45.68%)	151 (54.31%)	278 (100.00%)	

Table 5: Changes in sleep pattern in children during COVID-19 pandemic

S. No.	Sleep pattern	Yes	No	Total
1.	Increased daytime sleepiness	216 (77.70%)	62 (22.30)	278 (100%)
2.	Late awakening in the morning	200 (71.94%)	78 (28.06%)	278 (100%)
3.	Falling a sleep late night	129 (46.40%)	149 (53.60%)	278 (100%)
4.	Any change in timing for going to bed for sleeping	146 (52.52%)	132 (47.48%)	278 (100%)

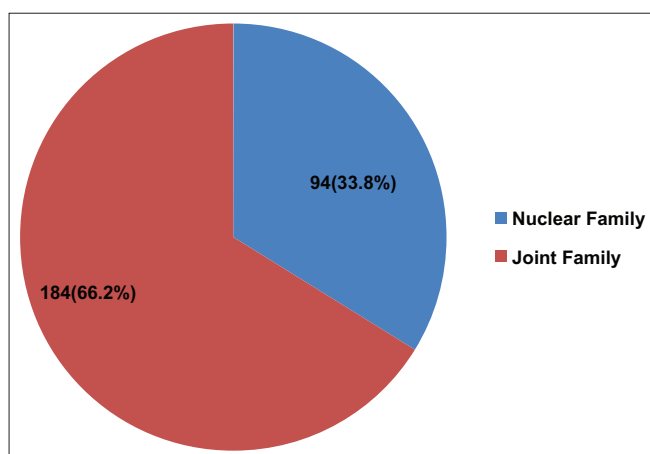


Fig. 3: Distribution of participants according to the type of family to which they belong (No.278)

physical activities decrease during COVID-19 due to enforcement of restriction to prevent the spread of COVID-19. This study (Table 2) showed that consumption of fast food/fried food significantly increased during COVID-19 pandemic may be due to work from home and restricted outdoor activities, parents have lot of free time and trying different type of recipes results in consumption of food intake increased. Similarly, in study of Pujia *et al.* [23], the consumption of "comfort food" has increased. Chocolate, sweet packaged snacks, ice cream, and desserts, as well as bread, pizza, and bakery products, are popular among children and adolescents. This study (Table 3) depicted that weight of children increased significantly during

COVID-19 pandemic seems to be due to decreased in physical activities and consumption of more fast food/fried food (high calorie intake) and sedentary life style. A study of Shook *et al.* [24] revealed low level of physical activities and uncontrolled energy intake result in gain in the weight of body. Similarly Pujia *et al.* [23] showed that approximately 16% of the children and adolescents studied gained more than 3 kg in body weight. This study (Table 4) depicted that consumption of fast food or fried food results in constipation/changes in bowel habits. A study of Delgado-Aros *et al.* [25] revealed that intake of excessive calorie associated with constipation. Another study of Gupta *et al.* [26] reported consumption of energy dense food associated with constipation. Table 5 depicted daytime sleepiness and late awakening in the morning found to be increased during covid-19 may be due to disturbances in routine activities such as closure of schools and restriction in outdoor activities.

CONCLUSION

During COVID-19 pandemic due to closure of schools and restricted outdoor activities results in decrease level of physical activities, increased consumption of high calorie food and sedentary behavior lead to increase in weight of children and changes in sleeping pattern of children.

ETHICAL APPROVAL

Taken from the Institutional Ethical Committee.

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AUTHORS CONTRIBUTIONS

Dr. Atul Rajpoot, Dr. Anand K. Patidar: Literature search, design, data acquisition, statistical analysis, manuscript preparation, and editing. Dr. Anurag Jain, Dr. Vikas Sharma: Collection of data, Writing-original draft. Dr. Peeti Gupta, Dr. *Mahesh Gupta: Conceptualization, methodology, formal analysis, writing original draft, supervision, writing-review, and editing.

CONFLICTS OF INTEREST

No conflicts of interest.

AUTHORS' FUNDING

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