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 due to decreased in physical activities and consumption of more fast food/fried food (high calorie intake) and sedentary life style. Restriction in social activity to reduce the spread of COVID-19 results in overall increase in the consumption of food intake specially snacks and sweets increased during lockdown [16]. Some studies results in overall increase in the consumption of food intake specially snacks and sweets increased during lockdown [16]. Some studies reported consumption of snacks and sweets increased during COVID-19 [17-19].

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 eating pattern of children.

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

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 result, 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 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 lifestyle changes among children of ≤15 years of age during COVID-19 pandemic
2. To find out the effect of lifestyle 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

\[ n = \frac{Z^2_{1-\alpha/2} \cdot \sigma^2}{d^2} \]

Where

- \( n \) = Sample size
- \( Z_{1-\alpha/2} \) = two tailed alpha error

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p=Population proportion
d=Precision
\[ Z_{1-\alpha/2} = 1.96 \text{ at 5% alpha error} \]

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

\[ q = 1 - p \]
\[ d = 5\% \ (0.05) \]
\[ n = \left(\frac{1.96}{0.235}\right)^2 \left(1 - 0.235\right)/(0.05)^2 \approx 276 \]

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.

<table>
<thead>
<tr>
<th>Education status of children</th>
<th>Before COVID-19 pandemic</th>
<th>During COVID-19 pandemic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Primary (Class LKG and UKG)</td>
<td>29 (10.43%)</td>
<td>146 (52.51%)</td>
</tr>
<tr>
<td>Primary (Class 1st- 5th)</td>
<td>152 (54.68%)</td>
<td>103 (37.06%)</td>
</tr>
<tr>
<td>Secondary (Class 6th- 10th)</td>
<td>152 (54.68%)</td>
<td>146 (52.51%)</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Consumption of fast/fried food</th>
<th>Before COVID-19 pandemic</th>
<th>During COVID-19 pandemic</th>
<th>Chi-square statistics=16.77 p=0.0002 (&lt;0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (≤1 times/day)</td>
<td>118</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>Moderate (2–3 times/day)</td>
<td>91</td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>High (≥4 times/day)</td>
<td>69</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>278</td>
<td>278</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

<table>
<thead>
<tr>
<th>Consumption of fast/fried food</th>
<th>Constipation/Changes in bowel habit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (≤1 times/day)</td>
<td>Yes: 5 (7.35%)</td>
<td>No: 68 (92.55%)</td>
</tr>
<tr>
<td>Moderate (2–3 times/day)</td>
<td>Yes: 32 (29.63%)</td>
<td>No: 76 (70.37%)</td>
</tr>
<tr>
<td>High (≥4 times/day)</td>
<td>Yes: 90 (92.78%)</td>
<td>No: 6 (7.22%)</td>
</tr>
<tr>
<td>Total</td>
<td>127 (45.68%)</td>
<td>151 (54.31%)</td>
</tr>
</tbody>
</table>

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

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

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. Vilesh Sharma: Collection of data. Writing original draft. Dr. Preeti Gupta. Dr. *Mahesh Gupta: Conceptualization, methodology, formal analysis, writing original draft, supervision, writing-review, and editing.

CONFLICTS OF INTEREST
No conflicts of interest.

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REFERENCES