

Effects of Home Confinement on Eating Behavior of Children During the COVID-19 Pandemic

Received: 18 August 2022, **Revised:** 21 September 2022, **Accepted:** 24 October 2022

Abhishek

Junior resident-3year, Department of Community Medicine, Santosh Medical College

Anupama Singh

Assistant professor, Department of Community Medicine, Santosh Medical College

Deepika Agrawal

Professor and Head, Department of Community Medicine, Santosh Medical College

Namrata Soni

Biostatistician cum Assistant professor, Department of Community Medicine, Santosh Medical College

Dr Kshitij Choudhary

Assistant professor, Department of Community Medicine, Santosh Medical College

Gajendra K Gupta

Professor, Department of Community Medicine, Santosh Medical College.

Corresponding author: Dr. Anupama Singh

Email ID: dranupamasingh2@gmail.com

Keywords

COVID-19, pandemic, sedentary lifestyle, screen time, mood swings, IAP guidelines

Abstract

Introduction -The pandemic of the coronavirus has resulted in nationwide school closures, and lockdown, which has resulted in sedentary lifestyle of children and adolescents for substantial amount of time. **Methodology**- This observational cross-sectional study was conducted from 27th July 2021 to 23rd Sept. 2021 among the individuals less than 18 years of age in urban population in Ghaziabad city through a house-to-house survey, using a pre-designed, semi-structured questionnaire. With 5% degree of precision, our minimum sample size was calculated to be 384. Since there were sufficient resources available and it was found that the sample size required for 99% confidence level was 664, therefore to enhance the reliability of the outcome of the study we collected the data for 666 individuals. **Result** - In this study 391 (58.7%) individuals were males and 275 (41.3%) females. Most of the study subject 275 (41.3%) belonged to the 5–10-year age group. Among the study participants in 1- 10-year age group odds of not doing physical activity were twice (OR 1.93 [95% CI 1.129 – 3.290]) as much as those in adolescent (10-18 years) age group. Odds of spending less than 2 hours in front of screen over and above online classes was more than twice 2.421 [95% CI 1.764-3.323] among children of parents who had lost their jobs during the pandemic than those children whose parents were employed. Chances of mood swings were 8 (OR 8.333 [95% CI 2.867-24.224]) times higher among children, whose fathers' education level was less than equal to intermediate than those children whose fathers were educated above intermediate level. **Conclusion:** This study identifies causes responsible for an altered lifestyle among children and their parents during the pandemic and determines an approach to prevent and/or reduce the harmful effects of these changes.

Journal of Coastal Life Medicine

1. Introduction

Government regulations and public health guidelines had imposed lockdowns and restrictions during the COVID-19 pandemic. While these constraints had the benefit of slowing the spread of infection, they had unfavourable impacts of restricting access to daily activities like outdoor exercises, travel, and social gatherings. [1]. Curfews were enforced in a number of countries which potentially limited physical activities of individuals, consequently resulting in low immunity and a poor capacity to combat infections. [2,3] People are prone to feel helpless, stigmatised, and afraid of getting sick or dying during infectious outbreaks [4,5]. During the influenza outbreak, between 10 and 30 percent of the general public indicated extreme or moderate fear about contracting the virus. Stress was exacerbated by these interruptions to their daily routines. [6, 7] People frequently experience stress and worry during pandemics, with a fear of getting sick or dying, being socially isolated while in quarantine, or losing their jobs. [3] Anecdotal data suggests that the foods people choose to eat more often when they are under stress are often rich in sugar and fat. [8]. This need to eat a certain type of food is known as a "food craving." In addition to cognitive (e.g., thinking about food), emotional (e.g., craving food or mood changes), behavioural (e.g., looking for and eating food), and physiological (e.g., salivation) elements, food cravings are multifaceted experiences. [9,10]. The desire for carbohydrates stimulates the production of serotonin, which improves mood. This effect on mood is proportional to food's glycaemic index [9]. Torres and colleagues discovered that people cope with stress by eating and drinking which makes them feel better ("stress-related eating"). These stressed-out eaters and drinkers were more likely to regularly consume unhealthy foods such as snacks, hamburgers, soda cola, and chocolate, as well as wine and spirits. Furthermore, a lack of emotional support from friends and family was predictive of stress-related eating and drinking behaviours [8,11].

2. Material Method

Study design

This observational cross-sectional study was conducted among individuals under the age of eighteen from July 27th to September 23rd, 2021, in urban population of Ghaziabad district through a door-to-door survey, using a quasi-structured questionnaire. Medical ethics committee of the institute approved the study before starting the survey. An informed consent was taken from all the participants in writing, maintaining their anonymity. A parent-perception questionnaire Child Eating Behaviour Questionnaire (CEBQ) assesses how children under the age of 12 behave when they eat. A slightly modified version of the questionnaire was used to analyse the dietary habits of young adults and adolescents during the epidemic. (13). Eight subscales comprising of three to six items each, each having a Likert scale rating of one to five, constitute the 35 items that make up this questionnaire. (14) Food responsiveness, enjoyment of food, emotional overeating, and desire to drink are the four subscales that assess behaviours related to food approach scales, whereas the remaining four subscales assess behaviours related to food avoidant scales (slowness in eating, satiety responsiveness emotional undereating, and food fussiness)

Sample size

To calculate the sample size, we assumed that the prevalence of changes in physical activity, screen time and family income among the children (less than eighteen years) during the COVID-19 pandemic was 50%. Since sufficient resources were available, at five percent degree of precision, and 99 % CI our sample size was calculated to be 664.

Out of the five zones of district Ghaziabad, 133 houses were selected randomly from each zone. resulting in 665 individuals. We randomly chose individuals less than eighteen years from each household; ultimately 666 children were selected residing in Ghaziabad city. We excluded those individuals whose parents refused to give consent for the study.

The information we gathered was analysed using the SPSS trial version 16. To determine the results,

Journal of Coastal Life Medicine

appropriate statistical tests of significance were used, and binomial logistic regression analysis was used to determine the relationship between various factors.

3. Results

Socio-demographic characteristics

Table 1 demonstrates the complete socio-demographic characteristics where there are 391

(58.7%) males, with the mean \pm SD age of 8.37 ± 4.3 years. Most of them [275 (41.3%)] belonged to five to ten years of age. Majority 218 (32.7%) of the fathers were graduates. There were equal number of high school pass 148 (22.2%) and illiterate 148 (22.2%) mothers in the study. Most of the fathers and mothers were found to be self-employed 346 (52.0%) and un-employed/homemaker 474 (71.2%) respectively

<u>Socio-demographic characteristics</u>	<u>Number (n=666)</u>	<u>Percentage (%)</u>
Age of children (in years)		
1-5	176	26.4
5-10	275	41.3
10-18	215	32.3
Gender of children		
Male	391	58.7
Female	275	41.3
Family income per month (in INR)		
Less than 10 thousand	156	23.4
10 thousand -50 thousand	306	45.9
50 thousand -90 thousand	90	13.5
90 thousand -1.30 lakh	49	7.4
1.30 lakh -2.10 lakh	25	3.8
2.10 lakh and above	40	6.0
<u>Children lifestyle related statistics</u>	<u>Number</u>	<u>Percentage</u>
	<u>(n=666)</u>	<u>(%)</u>
Physical activity of children		
Doing Physical activity	576	86.5
Not doing any physical activity	90	13.5
Food habit of Children		
Eating healthy food	490	73.6
Eating unhealthy food	141	21.2
No change in eating habit	35	5.3
Weight changes seen in children		
Increase	226	33.9
Decrease	259	38.9
No change	181	27.2
Time spent by children in front of screen (T.V/Laptop/Mobile) apart from online classes		
>2 Hour	292	43.8
<2 Hour	374	56.2

Journal of Coastal Life Medicine

Table 2 shows that 576 (86.5%) study participants were doing physical activity like running, cycling,

aerobics & dancing, while 90 (13.5%) of the children were not doing any physical activity at all.

Table 2: Descriptive statistics and Cronbach's alpha for CEBQ score

CEBQ	Number of items	Mean (SD)
Food responsiveness	5	2.7 (0.8)
Emotional over-eating	4	2.7 (0.8)
Enjoyment of food	4	3.3 (0.8)
Desire to drink	3	2.6 (0.9)
Satiety responsiveness	5	3.2 (0.6)
Slowness in eating	4	3.2 (0.6)
Emotional under-eating	4	3.2 (0.8)
Food fussiness	6	3.3 (0.5)

Table 3: Summarizes the of children during the pandemic

Subscales	Physical Activity	Family Income	Screen time apart from online classes
Food Approach			
Food Responsiveness (FR)	2.734 (0.967, 7.731)	1.131 (0.671, 1.906)	2.012* (1.211, 3.343)
Enjoyment of food (EF)	1.992* (1.142, 3.475)	1.934* (1.359, 2.754)	2.021* (1.443, 2.830)
Emotional overeating (EOE)	1.449 (0.669, 3.140)	0.693 (0.403, 1.193)	1.711* (1.056, 2.771)
Desire to drink (DD)	1.208 (0.614, 2.378)	0.917 (0.568-1.483)	1.640* (1.052, 2.556)
Food Avoidant			
Satiety responsiveness (SR)	1.423 (0.787, 2.572)	0.837 0.552, 1.2 69	1.426 (0.976, 2.084)
Slowness in eating (SE)	1.169 (0.677-2.020)	0.787 (0.524, 1.180)	1.618* (1.120, 2.338)
Emotional undereating (EUE)	1.525 (0.899, 2.588)	1.096 (0.762, 1.575)	2.264* (1.612, 3.179)
Food fussiness (FF)	2.245	0.909	2.920*

(1.197,4.210)

(0.616,1.342)

(2.025,4.212)

Table 3: reveals that chances of always enjoying food were three times higher [2.991 (1.040-8.591)] among children doing regular physical activity. Desire to drink two times less [4.012 (2.003-8.034)] among those doing physical activity.

Children doing physical activity often complained of food fussiness 1.99 (1.06-3.733)]. Children having a screen time of more than 2 hours were almost five times less food responsive [4.75(2.566-8.794)] than those who were spending less than 2 hours in front of screen.

Children having a screen time of more than 2 hours were enjoying food [3.265 (1.871-5.698)] always. Desire to drink was always higher 5.51 (1.487-20.416) among children having a screen time of more than 2 hours.

Emotional over eating was always found among 10.209 (1.216-85.71) those children who had a leisure screen time of more than 2 hours.

Children with more than 2 hours of screen time rarely showed satiety of responsiveness 3.072 (1.304-7.238). Children with a leisure screen time of more than 2 hours were 3.406 (1.518-7.643) slower in eating food than children who had a lesser screen time.

Children spending more than 2 hours of leisure screen time were more than twice as likely to show emotional under eating behaviour 2.55 (1.183-5.498) Children spending more than two hours of screen time were always found to have food fussiness [4.045(1.402-11.671)].

Enjoyment of food was twice often 2.201(1.482-3.267) among those having a monthly income of more than fifty thousand. Those having a family income of more than fifty thousand, were two times 1.944 (1.306-2.893)) rarely food responsive than those having lower income. Emotional over eating was four times 4.09 (2.288- 7.311) less in families having an income of more than Rs 50,000 per month than in families with a lesser income. Satiety of responsiveness was three times 3.226 (1.489-

6.992) rarely reported by families with a higher family income.

4. Discussion

This study included 666 participants, with 8.37 as the mean age \pm 4.3 years. The majority of them [275 (41.3%)] were between the ages of five and ten. The majority of participants, 576 (86.5%), were engaged in some form of physical activity such as running, cycling, aerobics, or dancing.

Our findings were that the scores for "food-avoidant" behaviours were more than those for "food-approach" behaviours, which contradicted the findings of Ekkarit Panichsillaphakit et al, who conducted their study on obese children. Food enjoyment received the maximum score in the "food approach" subscales, while food fussiness received the maximum score in the "food avoidant" subscale. Ekkarit et al. confirmed these findings, observing that enjoyment of food was a food liking behaviour and a strong predictor of how likely it is to be consumed. Carnell and Wardle investigated faster eating rates and higher caloric intake and discovered a link between food enjoyment and food responsiveness. (15)

Children who enjoy food more are also more likely to consume more food even when they are satiated. The food fussiness subscale, on the other hand, had the highest "food-avoidant" behaviour scores. Recent research [16] suggests that food fussiness may play a role in the development and maintenance of paediatric obesity. Food fussiness, also known as fastidious eating, means refusal to have particular foods or try new food items, leading to limited consumption of food items. Fussiness related to food usually appears around the age of six and remains constant throughout childhood. Individuals who watch television are more likely to eat unhealthy food items simultaneously acquiring poor eating habits from advertisements and television programmes [17]. Frequent exposure to fast food advertisements tempts individuals to consume more of unhealthy food. [18]. Commercials affect the mind set of individuals, influencing their food-

Journal of Coastal Life Medicine

eating preferences and practises. These results indicate that higher satiety responsiveness and eating slowly may be protective of overconsumption of food. [19-23].

5. Conclusion

Globalisation and over exposure to media has made it a challenge for new generation parents to inculcate healthy eating habits in their children. This is even more demanding for parents who are working, single parent who are struggling to strike a work life balance, especially in low-income families. This study suggests that eating balanced diet with regular physical activity and reduced screen time may help children to good health.

Reference

- [1] Hossain, M.M.; Sultana, A.; Purohit, N. Mental health outcomes of quarantine and isolation for infection prevention: A systematic umbrella review of the global evidence. SSRN Electron. J. 2020. [CrossRef]
- [2] Bloch, W.; Halle, M.; Steinacker, J.M. Sport in times of Corona (Sport in Zeiten von Corona). Ger. J. Sports Med. 2020, 71, 83–84. [CrossRef]
- [3] Steinacker, J.M.; Bloch, W.; Halle, M.; Mayer, F.; Meyer, T.; Hirschmüller, A.; Roecker, K.; Wolfarth, B.; Nieß, A.; Reinsberger, C. Merkblatt: Gesundheitssituation für Sportler durch die aktuelle Coronavirus-Pandemie (SARS-CoV-2/COVID-19). Dtsch. Z. Sportmed. 2020, 71, 85–86. [CrossRef]
- [4] Jeong H, Yim HW, Song Y-J, Ki M, Min JA, Cho J, et al. Mental health status of people isolated due to Middle East respiratory syndrome. Epidemiol Health 2016;38: e2016048.
- [5] Lee S, Chan LY, Chau AM, Kwok KP, Kleinman A. The experience of SARS-related stigma at Amoy Gardens. Soc Sci Med 2005;61: 2038e46.
- [6] Hall RCW, Chapman MJ. The 1995 Kikwit Ebola outbreak: lessons hospitals and physicians can apply to future viral epidemics. Gen Hosp Psychiatr 2008; 30:446e52.
- [7] Rubin GJ, Potts HWW, Michie S. The impact of communications about swine flu (influenza A H1N1v) on public responses to the outbreak: results from 36 national telephone surveys in the UK. Health Technol Assess 2010; 14:183e266
- [8] Torres SJ, Nowson CA. Relationship between stress, eating behavior, and obesity. Nutrition 2007;23(11- 12):887e94. <https://doi.org/10.1016/j.nut.2007.08.008>.
- [9] Muscogiuri G, Barrea L, Savastano S, Colao A. Nutritional recommendations for CoVID-19 quarantine. Eur J Clin Nutr 2020. <https://doi.org/10.1038/s41430-020-0635-2> [published online ahead of print, 2020 Apr 14].
- [10] Rodríguez-Martín BC, Meule A. Food craving: new contributions on its assessment, moderators, and consequences. Front Psychol 2015; 6:21.
- [11] Laitinen J, Ek E, Sovio U. Stress-related eating and drinking behavior and body mass index and predictors of this behavior. Prev Med 2002;34(1):29e39. <https://doi.org/10.1006/pmed.2001.0948>.
- [12] D. A. Loh, F. M. Moy, N. L. Zaharan, and Z. Mohamed, “Eating behaviour among multi-ethnic adolescents in a middle-income country as measured by the self-reported children’s eating behaviour questionnaire,” *PloS One*, vol. 8, no. 12, Article ID 82885, 2013.
- [13] J. Wardle, C. Guthrie, S. Sanderson, L. Birch, and R. Plomin, “Food and activity preferences in children of lean and obese parents,” *International Journal of Obesity*, vol. 25, no. 7, pp. 971–977, 2001.
- [14] Panichsillaphakit E, Chongpison Y, Saengpanit P, Kwanbunbumpen T, Uaariyapanichkul J, Chomtho S, Pancharoen C, Visuthranukul C. Children’s eating behavior questionnaire correlated with body compositions of thai children and adolescents with obesity: A pilot study. Journal of Nutrition and Metabolism. 2021 Jan 15;2021.
- [15] S. Carnell and J. Wardle, “Measuring behavioural susceptibility to obesity: validation of the child eating behaviour questionnaire,” *Appetite*, vol. 48, no. 1, pp. 104–113, 2007.
- [16] Taylor, C. M., & Emmett, P. M. (2019). Picky eating in children: causes and consequences. *The Proceedings of the Nutrition Society*, 78(2), 161–169. <https://doi.org/10.1017/S0029665118002586>.
- [17] Jess Haines, Emma Haycraft, Leslie Lytle, Sophie Nicklaus, Frans J. Kokke, Mohamed

Journal of Coastal Life Medicine

- Merdjif, Mauro Fisbergg , Luis A. Morenoh , Olivier Gouleti , Sheryl O. Hughes, Robinson, T.N.; Banda, J.A.; Hale, L.; Lu, A.S.; Fleming-Milici, F.; Calvert, S.L.; Wartella, E. Screen Media Exposure and Obesity in Children and Adolescents. *Pediatrics* 2017, 140, 97–101
- [18] Story M, French S. Food advertising and marketing directed at children and adolescents in the US. *International Journal of Behavioral Nutrition and Physical Activity*. 2004 Dec;1(1):1-7.
- [19] Robinson, E., Almiron-Roig, E., Rutters, F., de Graaf, C., Forde, C. G., Smith, C. T., et al. (2014). A systematic review and meta-analysis examining the effect of eating rate on energy intake and hunger. *American Journal of Clinical Nutrition*, 100, 123–151.
- [20] Russell, C. G., & Worsley, T. (2016). Associations between appetitive traits and food preferences in preschool children. *Food Quality and Preference*, 52, 172–178.
- [21] S´anchez, U., Weisstaub, G., Santos, J. L., Corval´an, C., & Uauy, R. (2016). GOCS cohort: children’s eating behavior scores and BMI. *European Journal of Clinical Nutrition*, 70, 925–928.
- [22] Santos, J. L., Ho-Urriola, J. A., Gonz´alez, A., Smalley, S. V., Dom´ınguez-V´asquez, P., Cataldo, R., et al. (2011). Association between eating behavior scores and obesity in Chilean children. *Nutrition Journal*, 10, 108.
- [23] Haines J, Haycraft E, Lytle L, Nicklaus S, Kok FJ, Merdji M, Fisberg M, Moreno LA, Goulet O, Hughes SO. Nurturing children's healthy eating: position statement. *Appetite*. 2019 Jun 1; 137:124-33.