



The Impact on Children's Lifestyle and Behaviour Due to COVID-19 Pandemic- A Questionnaire Study

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: The "COVID-19" pandemic has caused huge changes in people's lifestyle, health, and social relationships. This situation has had an intense impact on children, affecting their health, intellectual, physical, and emotional development. The aim of this study was to investigate the impact of "COVID-19" lockdown measures on the diet, behaviour and physical activities of children.

Study Design: A questionnaire study.

Place and Duration of Study: Department of Public Health Dentistry, M. A. Rangoonwala College of Dental Sciences and Research Centre, Pune, Maharashtra, between January 2022 and June 2022.

Methodology: A study was conducted among the pediatric population in Pune, a metropolitan city of Maharashtra. The participants were selected based on the age group ranging from 1 to 14 years. The structured, self-administered, and close-ended questionnaire comprised of 29 questions which included demographic data such as name, age, gender, and education. The statistical analysis was done using the descriptive statistics.

Results: In this study, there were total of 180 participants of age 1-14 years of age. About 87.3% of the participants were aware about balance diet and around 86.6% of the participants knew about the effects of excessive sugar on health. About 52.8% of the participants believed that "COVID-19" pandemic has reduced physical activities in children.

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Conclusion: The level of knowledge of the participants in the study was adequate, while the attitude and practice relating to diet, lack of physical activities, excessive screen time and sedentary behaviors during "COVID-19" pandemic was average in the participants.

Keywords: Diet; eating behavior; physical activities; screen time; sedentary behavior.

1. INTRODUCTION

The pandemic "COVID-19" caused due to virus SARS-CoV-2 had a long term and intense impact on general population especially children [1]. One of the major excepted prevention method from Corona virus in various countries was implementing lockdown and social distancing strategies, including closing schools to confine the transmission of virus [2]. However, lockdown had resulted in complete lifestyle and behavioral change which had greater effect than the infection itself. Changes such as increased screen time, emotional distress, sedentary behaviour, decreased physical activities have been seen highly in children [3]. Along with physiological and physical impact "COVID- 19" has led to new fears, increased irritability, intolerance to rules, nervousness, tantrums and excessive demands, as well as mood changes and sleep problems in children [4]. Isolation had major impact on eating behaviour of the children which can be defined as food choices that are moderated by consumption trends, personal preferences, specific diets and calorie counting [5]. Interruption of daily routine and boredom has lead to stressful lifestyle which indirectly triggered towards overeating mostly sugar containing foods "comfort foods" [6]. The collateral effects of "COVID-19" has mainly effected the mental health of vulnerable population and requires some practical and targeted measures [7]. The main purpose of this study was to determine if there was any change in children's nutritional lifestyle during "COVID-19" pandemic. Do children eat more unhealthy food with high calorie? Was the intake of sugar increased in children and does increase in sugar intake leads to irritability in children. In this study we have tried to find out what was the diet of children during Covid period and to understand that were parents aware about sugar substitutes and also the effect of excessive sugar intake on health of children.

2. MATERIALS AND METHODS

A questionnaire study was conducted among the pediatric population in Pune, a metropolitan city of Maharashtra. The study was aimed to assess

the knowledge, attitude and practice regarding the lifestyle changes in children during COVID 19 pandemic period. The participants were selected based on the following inclusion criteria: a) Age group below 14 years, b) Individuals who are willing to participate in the study. c) Residents of western India. However, individuals above 14 years of age and physically and mentally challenged people were excluded from this study. The input parameters for sample size calculation were as follows: 80% power of the study, alpha error 0.05, effect size 0.3 (medium), and degree of freedom as 5. The calculated sample size was 180 using G* Power software version 3.1.9.2 (Heinrich Heine University, Düsseldorf). The final considered sample size for the study was around 180. The convenient sampling technique was used in the study. The questionnaire was prepared in English language. The questionnaire was pretested and validated among 20 subjects to assess their knowledge, clarity and responsiveness. The reliability statistics were calculated and the Cronbach Alpha was 0.621. The Performa was designed to collect data and consisted of different sections with 35 questions regarding knowledge, attitude and practices. Section one included the demographic data of subjects such as name, age, gender, education, etc. The second section included questions related to know the knowledge of participants. And third section was questions related to attitude whereas final section included practice based questions. The questionnaire was designed on Google form (Google LLC, mountain view, California United States) and the link was distributed among study population via email. WhatsApp and other social media platform. The statistical analysis was done using the descriptive statistics.

3. RESULTS

In Table 1, there were a total of 180 children which participated in the study. The age group varied between 01 and 14 years. Out of 180 participants, 91 participants were male and there were 89 female participants. Around 82.2% parents said that they had income below 50,000 and remaining had income above 50,000. Around 47.2% parents had completed their

graduation and 52.8% participants said that they did not complete graduation. In Table 2, around 87.3% of the participants were aware about balance diet and 86.6% of the participants knew about the effects of excessive sugar on health. In Table 3, around 52.8% of the participants believed that “COVID- 19” pandemic has reduced physical activities in children. According to 55% of the participants Decreased physical

activity leads to increase in the prevalence of obesity whereas, around 60% favour that Healthy eating can help prevent many chronic diseases. In Table 4, around 57.2% of the participants believe that their child changes mood for no apparent reason and 58.3% participants say that their child's mood is affected by what he/she eats.

Table 1. Demographic details of study participants (N=180)

Sr. No.	Demographic details	Responses	N	%
1	Age of the child	1-5 years	7	3.9%
		5-10 years	73	40.6%
		10-14 years	100	55.5%
2	Gender of the child	Male	91	50.6%
		Female	89	49.4%
3	Child's education	Lower kindergarten to 4 th Standard	45	25%
		5 th to 9 th Standard	135	75%
4	Parents education	Nil to Higher secondary School	95	52.8%
		Graduate	85	47.2%
5	Parents occupation	Government	58	32.2%
		Private	122	87.8%
6	Parents income	Nil to 50,000 Rupees	148	82.2%
		Above 50,000 Rupees	22	17.8%

Note: N - Number, % - percentage

Table 2. Knowledge related questions responses of study participants (N=180)

Sr. No.	Questions	Responses	N	%
1	What as per you is Balanced diet	Carbohydrates (cereals and grains)	8	4.4%
		Proteins (egg , meat, lentils)	6	3.3%
		Fats (oils, nuts)	1	0.6%
		Vitamins and minerals	8	4.4%
		One which includes all of the above	157	87.3%
2	What efforts can you make as a parent to make your child's diet healthy	Restrict sugar intake	4	2.2%
		Restrict junk food intake	26	14.4%
		Focus on balanced diet	12	6.7%
		All of the above	138	76.7%
3	Are you aware of effects of excessive sugar on health	Diabetes	19	10.5%
		Anxiety	2	1.2%
		Stomach ache/indigestion	5	2.7%
		Eyesight problem	0	0%
		All of the above	154	86.6%
4	Are you aware of side effects of junk food	Obesity	10	5.6%
		Lack of energy and concentration	3	1.6%
		Poor growth and low immunity	10	5.6%
		Constipation and other digestive issue	1	0.5%
		All of the above	156	86.7%
5	Are you aware of effects of increase in frequency of snacking on health	Obesity	8	4.5%
		Increase in tooth cavity	1	0.6%
		Reduce hunger at meal time	4	2.2%
		Increase in risk of losing out of important nutrients	6	3.3%
		All of the above	161	89.4%

Sr. No.	Questions	Responses	N	%
6	Are you aware of different sugar substitutes	Sucralose	7	3.9%
		Saccharine	5	2.8%
		Neotame	3	1.7%
		Stevia	34	18.9%
		All of the above	105	58.3%
		None of the above	26	14.4%
7	What factors influence your child eating behavior	Availability of food	11	6.1%
		Eating routine	5	2.8%
		Emotions	4	2.2%
		Food marketing	27	15%
		All of the above	133	73.9%
8	Are you aware of correlation between diet and behavior changes	Impact on mood	4	2.2%
		Impact on learning capabilities	8	4.5%
		Anxiety and depression	0	0%
		Increase in sugar level	2	1.1%
		All of the above	166	92.2%
9	Sedentary behavior refers to	Sitting for long periods	9	5%
		Playing passive video games	4	2.2%
		Watching television /Mobiles	13	7.2%
		All of the above	154	85.6%
10	Are you aware of common stress induced behavior changes in children	Excessive crying and irritability	29	16.1%
		Regressive behaviour like bed wetting and toileting	33	18.3%
		Poor sleep and eating habits	34	18.9%
		Overreaction to minor problems	53	29.5%
		Acting out behaviour like temper tantrums	31	17.2%
11	According to you which are different ways to promote child's health and wellness.	Meditation	16	8.8%
		Sleep routine	6	3.3%
		Talk to your child about their feelings	82	45.6%
		Focus on mental health	55	30.6%
		Limit screen time	21	11.7%
12	Which all multimedia device your child use	Mobile	90	50%
		Television	31	17.2%
		Laptop	0	0%
		Tablet	2	1.1%
		All of the above	57	31.7%
13	What is the usual screen exposure time of your child	< 1 hour/day	0	0%
		1-2 hours/day	8	4.4%
		2-3 hours/day	38	21.1%
		> 3 hours/day	134	74.5%
14	Which all physical activities was child involved during "COVID-19" outbreaks	Yoga	0	0%
		Exercise	3	1.7%
		Dancing	8	4.4%
		Regular household activities	27	15%
		None of the above	142	78.9%
15	Are you aware of effects of lack of physical activities on child's health	Weight gain	10	5.6%
		Heart disease	0	0%
		High blood cholesterol	0	0%
		Poor blood circulation	0	0%
		All of the above	170	94.4%

Note: N - Number, % - percentage

Table 3. Attitude related responses of study participants (N=180)

Sr. No.	Questions	Responses	N	%
1.	Do you think child's daily sugar intake was increased during "COVID-19" pandemic.	Strongly agree	142	78.9%
		Agree	30	16.7%
		Neutral	3	1.7%
		Disagree	5	2.7%
		Strongly Disagree	0	0%
2.	Increase in sugar intake leads to irritability in children.	Strongly agree	110	61.1%
		Agree	63	35%
		Neutral	4	2.2%
		Disagree	3	1.7%
		Strongly Disagree	0	0%
3	Healthy eating can help prevent many chronic diseases.	Strongly agree	108	60%
		Agree	61	33.9%
		Neutral	7	3.9%
		Disagree	4	2.2%
		Strongly Disagree	0	0%
4	Do you believe that because of "COVID-19" pandemic restrictions had contributed towards increase in lack of communication and social skills among children.	Strongly agree	89	49.4%
		Agree	62	34.4%
		Neutral	22	12.3%
		Disagree	7	3.9%
		Strongly Disagree	0	0%
5	"COVID-19" pandemic has helped in reducing street food/ junk food intake in children	Strongly agree	46	25.5%
		Agree	61	33.9%
		Neutral	12	6.7%
		Disagree	29	16.1%
		Strongly Disagree	32	17.8%
6	"COVID-19" pandemic has reduced physical activities in children	Strongly agree	95	52.8%
		Agree	75	41.7%
		Neutral	7	3.8%
		Disagree	3	1.7%
		Strongly Disagree	0	0%
7	Decreased physical activity leads to increase in the prevalence of obesity	Strongly agree	99	55%
		Agree	69	38.4%
		Neutral	6	3.3%
		Disagree	6	3.3%
		Strongly Disagree	0	0%
8	Balanced diet helps in improving immune system, growth and development, provides energy etc.	Strongly Agree	115	63.9%
		Agree	52	28.9%
		Neutral	10	5.6%
		Disagree	3	1.6%
		Strongly Disagree	0	0%

Note: N - Number, % - percentage

4. DISCUSSION

"COVID-19" pandemic had an intense impact on health and lifestyle behaviors in children [8]. Our results present that there were differences in eating behaviors, level of physical activity, hours of sleep, and screen time among children before and during the "COVID-19" pandemic [9]. Additionally, variables such as gender and age, that did not show a correlation with specific eating behaviour as well as the influence of mental health [4]. According to our survey,

around 87.2% of the total population were aware of Balanced diet. Around 85.6% of the population were aware of the effects of excessive sugar on health, in contrast to a study done prior by Scapaticci S et al. where only 46.5% declared a greater consumption of sweets and sugar-added food in comparison to before the lockdown [9]. Around 96.1% of the population believed that increased sugar intake leads to irritability in children. Around 58.3% of the population were aware of different sugar substitutes. In our study we found that 89.4% of the participants were

aware of effects of increase in frequency of snacking on health, which is a better score than previous finding which reported a score of 49% by Bhol A et al. in 2021 [10]. Around 85.6% participants in our study were aware about sedentary behaviour whereas, 92.2% of the participants were aware of correlation between diet and behavior changes which is an improvement while comparing to previous literature by Philippe K et al. found that only 60% reported a change in eating behaviors during the lockdown compared to the period before the lockdown [11]. According to our study 45.6% population believed that talking to their child about their feeling is the best way to promote child's health and wellness whereas 30.6% participants believed that focus on mental health was important. In our study we found that 86.5% participants says that their child's mood changes for no apparent reason whereas, 86.6% participants say that their child mood is affected by what they eat. Digital media and devices are an integral part of the modern world. During the pandemic, the use of these devices has become a condition of everyday functioning not only for adults but also for children. Despite the potential benefits, excessive and inappropriate use of technology may have an effect on children's

development and health⁸. In our study we found that screen time was increased by more than 3 hours/day in 74.5% of the participants in contrast to the study done by Seguin D et al. [12]. The use of electronic gadgets (such as mobile, television, laptop, tablet) has increased in children due to closed schools and because of very less extra-curricular activities. Online shift in education has also played a major role in increase screen time. The study done by Stockwell S et al. found 50% of its population reported decreased physical activities, in contact to which our study we found 78.9% decrease in physical activities [13]. Around 93.4% of the population said that there was increase in prevalence of obesity during "COVID- 19" pandemic due to decrease physical activities in children. Meanwhile, this study also has several strength. This study will help us understand what are the major reason for change in the lifestyle of the children, it will help us to address what were the impacts of lockdown on the children. We will also be able to find out the effects of eating behaviour on children's mood, and the sugar intake quantity in children during Covid-19 pandemic. It is the study that looked in a more systemic way to bring change in children food habits and lifestyle during the COVID-19

Table 4. Practice related responses of study participants (N=180)

Sr. No.	Questions	Responses	N	%
1	How often does your child eat junk food.	Always	150	83.4%
		Often	24	13.3%
		Rarely	6	3.3%
		Never	0	0%
2	Does your child over eat	Always	110	61.1%
		Often	46	25.6%
		Rarely	16	8.9%
		Never	8	4.4%
3	Does your child get enough sleep and nutrition	Always	66	36.6%
		Often	46	25.6%
		Rarely	40	22.2%
		Never	28	15.6%
4	Did you have any immune booster food/ drinks / healthy alternative during "COVID-19" period	Always	49	27.2%
		Often	36	20%
		Rarely	38	21.1%
		Never	57	31.7%
5	Does your child changes mood for no apparent reason	Always	103	57.2%
		Often	51	28.3%
		Rarely	18	10%
		Never	8	4.5%
6	Does your child's mood is affected by what he/she eats.	Always	105	58.3%
		Often	51	28.3%
		Rarely	14	7.8%
		Never	10	5.6%

Note: N - Number, % - percentage

lockdown, including eating and cooking behaviors, parental feeding practices and parental motivations when buying foods for children [11]. The limitation of this study was the small sample size population considered. Hence, the present study can be done using the large population with different variables of topic in various locations of India or worldwide.

5. CONCLUSION

The level of knowledge of the participants in the study was adequate, while the attitude and practice relating to diet, lack of physical activities, excessive screen time and sedentary behaviors during covid 19 pandemic was average in the participants.

6. RECOMMENDATIONS

1. Children should avoid high-fat, fried snacks. They should also avoid consumption of sugary foods such as cakes, chocolates and biscuits.
2. Children should be encouraged for physical activities such as yoga, dancing, exercise or regular household activities.

CONSENT

As per international standard or university standard, parental' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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- Changes in physical activity and sedentary behaviours from before to during the

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