



CASE REPORT

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EVALUATION OF VARIATION OF DIETARY AND ORAL HYGIENE PRACTICES SEEN IN CHILDREN AGED 5- 8 YEARS, IN THE DIFFERENT PHASES OF THE LOCKDOWN AND POST LOCKDOWN IMPLEMENTED DUE TO COVID 19 PANDEMIC SITUATION: AN OBSERVATIONAL STUDY

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ABSTRACT

In this observational study, questionnaires were sent to the parents of children at 3 phases of lockdown that is phase 1, phase 2 and post lockdown aged 5 to 8 years, to check for the variation seen in ingestion of food items which were related to dental caries usually. Also questions related to oral hygiene practices, their variation in different phases and also questions relating to use of fluoride toothpaste were asked. Results showed increase in consumption of food items which were cariogenic nature and also better oral hygiene practices were followed, may be due to the parental presence in the lockdown.

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INTRODUCTION

Dental caries is a multifactorial disease but the amounts and frequencies of consumption of free sugars are the most important aetiological factors in its development. Conclusive evidence supports the association between sugars intake and dental caries,¹⁻⁹ and control of sugars intake is an effective factor in preventing dental caries whereas a second important factor is use of fluorides. Changing life-styles and dietary patterns have led to a marked increase in caries incidence in developing countries.⁷⁻¹⁴ The role of the diet in the development of dental caries is not simply one contributor to a multi-factorial disease process¹⁵ rather, dietary patterns and

choices either provide or do not provide fermentable carbohydrates (including sugars), which are the major essential precursor to caries formation¹⁶. While preventive strategies such as fluoride (in water, toothpaste, and via clinical procedures) have been shown to effectively reduce the speed at which carious lesions develop, they do not address the principal underlying cause of the disease process, which is the intake of dietary sugars without this, caries would not occur. A high-sugar diet is an important risk factor for dental caries, which is considered the most prevalent and has the second-highest incidence in the world.¹⁷ The subsequent multivariate analyses showed that the socioeconomic level, snack consumption frequency, consumption of sweets and the use of Fluoride supplements were mostly associated with caries prevalence in both dentitions. Other indicators, such as gender, age, geographic location, between-meal snack consumption frequency, consumption of sweet drinks, tooth brushing frequency and onset of regular tooth brushing habits also showed some significant associations with dental caries across

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the age groups and/or dentitions.¹⁸ Oral hygiene also plays an important role in the prevention of caries and periodontal diseases, and proper oral hygiene ought to be emphasised already from early childhood¹⁹. Oral hygiene habits are established in stages of development and are influenced by parental behaviours, predominantly of mothers, as they are often the primary caregivers of their children (Mohebbi, Virtanen, Murtomaa, Vahid- Golpayegani, & Vehkalahti, 2008). At the beginning of 2020, the novel virus severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) appeared, causing the corona virus disease (COVID-19). In the present situation of Pandemic Covid 19, where the country had come to a standstill and lockdowns were implemented for the effective control of the same, people were bound to their houses and so were the children. In these conditions when the children were not even let to play outside or with their friends or have any kind of social interactions with their peers or friends due to the protocol of social distancing that had to be followed the children tend to feel bored at home and look for activities which kept them off boredom. As they were at home 24 hours a day and for days together, dietary practices tend to change drastically, as the child may be frequently snacking or there may be a variation in the amount and frequency of sugar/ carbohydrate consumption seen, and practices of oral hygiene methods may be neglected, which in turn leads to the formation of caries. As the dental clinics were also closed as per the rule, maintaining oral health became the main concern for the parents, and also to avoid the dental clinic visits in pandemic conditions. The first phase of lockdown was implemented on 25th March to 14th April where in there were, Ban on people from stepping out of their homes. With the steady rise in number of cases of Covid 19 the extension of the lockdown period was seen, which is the phase 2. By 4th May the lockdown period was then extended up to 17th May which is the 3rd phase of lockdown, from 4th May 2020, the lockdown was eased with several relaxations in all zones per Ministry of Home Affairs guidelines. So by the 3rd phase of the lockdown, few of the parents had started their daily routine of office work.

Aim

-) To evaluate the variation seen in frequency of consumption of food items and also oral hygiene practices followed by the children in different phases of the lock down period and also post lockdown, during the present Covid 19 Pandemic situations

Objectives

) To evaluate the dietary pattern of children during COVID 19 lockdown situation

) To create awareness among the parents about the steps in prevention of dental caries during COVID 19 lockdown

METHODOLOGY

Study Population: Our study population consisted of children aged 5- 8 years and their parents who were at home in the present lockdown situation. The study had inclusion criteria for samples stating all healthy children aged 5-8 years and exclusion criteria of, children with nutritional deficiencies, medically compromised children, children below the age of 5 years, children above the age of 8 years. This survey was

initiated in April 2020 at the beginning of the 2nd phase of lockdown and was followed up until the post lockdown for comparison. An online questionnaire using Google Forms was used to collect the data. The online questionnaire was first sent to a panel of expert Pedodontists who validated the Questions [S- CVI was 0.67 (Good content validity)]. A pilot study was then done amongst 30 willing participants to estimate the sample size.

Amongst the 30 samples, 15 samples were asked to take the survey again for the reliability test (Reliability- internal consistency : Cronbach's alpha is 0.7 acceptable; Test retest reliability was 0.75- good). Using this proportion the sample size is calculated using the formula $n = (Z^2 \times P(1 / P)) / e^2$. The sample size was estimated to be 375 and adjusting the 5% margin of error the final sample size was calculated as 394.

Study design: This cross sectional observational questionnaire study was done on children aged 5- 8 years and their parents. The study was initiated subsequent to approval of KVG Dental College Ethical Committee. A list of subjects satisfying the inclusion criteria and those who are willing to participate in the study were selected. After the sample selection, an online questionnaire consisting of questions related to frequency of caries related food consumption in children aged 5-8 years in the lockdown phases due to COVID 19, which was duly filled by the samples of the study that is the parents. Samples were contacted through their contact numbers and the questionnaire was circulated in few of the school Whatsapp groups.

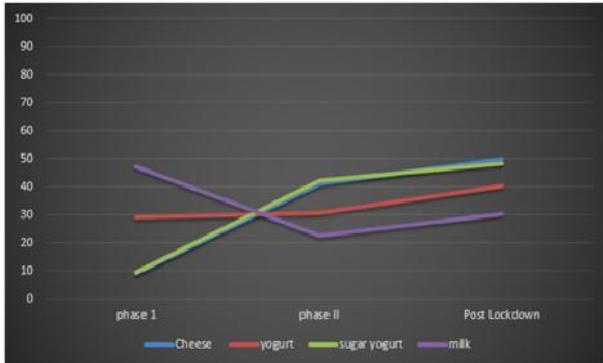
The questionnaire consists of open ended demographic questions such as Age, Gender, Place of living and Socio economic status of the child followed by closed end questions listing food substances with high sugar content and which are related to dental caries. Options are provided to specify its frequency of consumption, checkboxes were provided for parents to select the appropriate option. Each question is followed by a sub question asking to specify the serving size, which is again a closed end question with a checklist provided for each phase of lockdown to check for any variation seen in the dietary pattern of the children in the subsequent phases of the lockdown. Also questions of oral hygiene practices followed and use of fluoride dentifrices were also included in the questionnaire. Responses were collected via Google forms. Data was recorded and scored based on the frequency of food consumption by assigning points for each option, like 1 point if the child never had that food item, 2 points if they had it rarely and so on. This data was then entered in an excel sheet and was statistically analysed.

STATISTICAL ANALYSIS

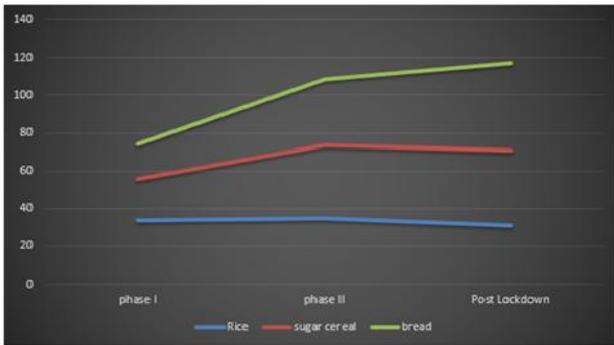
Of the total 394 participants, 15 questionnaires were used in the reliability sample. No missing data was found in test-retest reliability sample. Data were entered into the computer and checked for accuracy. Data management and analyses were conducted. The internal consistency and test-retest reliability of Food Frequency Questionnaire were assessed using Cronbach's alpha and intraclass correlation coefficient (ICC), respectively. Newly developed measures can be accepted with Cronbach's alpha of >0.5, otherwise 0.7 should be the threshold. Chi square test and Repeated ANOVA tests were used to determine the relationship between different variables of food consumption frequencies and Frequency of oral hygiene habits practices followed.

RESULTS

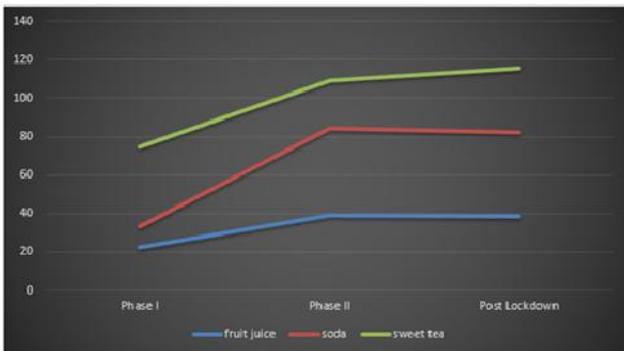
Finally 394 parents completed the questionnaire. 13 were excluded from the validity study because the questionnaires were not complete. The questionnaire took about 3-5 minutes to complete. Table 1 shows the variation seen in consumption of dairy products in different phases of lockdown and also post lockdown, cheese was mostly



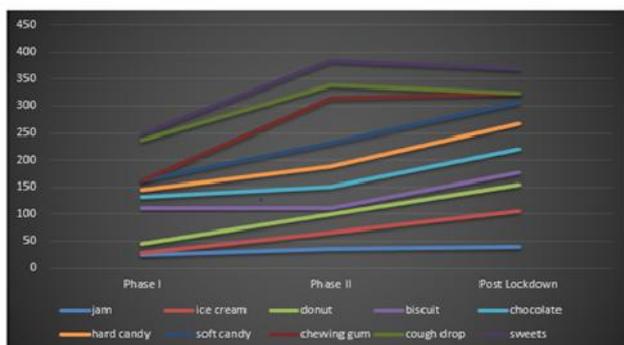
CONSUMPTION OF DAIRY PRODUCTS DURING LOCKDOWN PERIOD



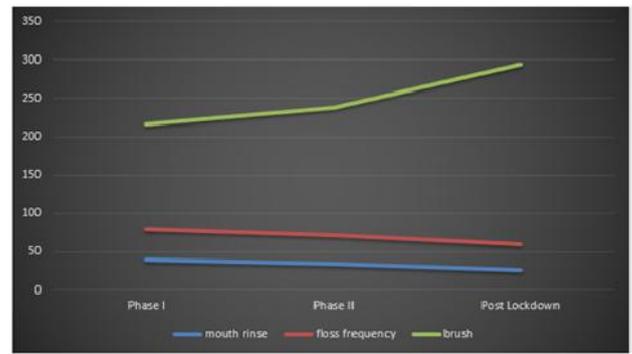
CONSUMPTION OF CARBOHYDRATES DURING LOCKDOWN PERIOD



Consumption of beverages during lockdown



Consumption of liquid, solid and sticky, and slowly dissolving types of sugars during lockdown



Variation of Oral hygiene practices during lockdown

consumed once a week, in most of the groups which showed an increase from 9% in first phase of lockdown which increased to 41% in the second phase to almost 49% in post lockdown period, in the same way variations were also seen in consumption of yogurt which was consumed 29% in the first phases of the lockdown, 30.6% in the second phase which increased to 41% by the time of post lockdown phase. Variations were also seen in the consumption of other dairy products such as sweetened yogurt and even milk which again reported an increased consumption in the post lock down period when compared to the lockdown period. Variations were seen not only in frequency of consumption but also the amount of consumption of each. Consumption of carbohydrates, like Rice, sugared cereal and bread also showed increased rate and amount of consumption in the lockdown period, but much less when compared to the consumption of sweets and chocolates in the different phases as shown in the Table 2 and Table 4. Table 3 shows the variation of consumption of various beverages in the different phases of the lockdown and post lockdown, soda was consumed almost 20% in the first phase which increased to 28% in the second phase and then increased by 43% post lockdown. Table 5 shows the variation of oral hygiene practices in the different phases, such as frequency of mouth rinsing, flossing and brushing of teeth. Brushing of teeth which was usually done once daily, showed changes to twice daily as the phases changed, this may be due to the attention of the parents towards the child's dental health in the phase. In addition to these the use of Flouride tooth paste was also asked. Parents residing in the cities showed better knowledge about the Flouride tooth paste and also knew the use of the same when compared to the parents in Rural and Semirural areas.

Consumption of cheese

		Count	Lockdown Phases			P-value
			LOCKDOWN 1	LOCKDOWN 2	Post Lockdown	
cheese	never		289	258	200	
	% within cheese		09.8%	30.8%	28.5%	
rarely	Count		11	21	29	
	% within cheese		37.2%	20.7%	35.1%	
once per week	Count		9	27	100	
	% within cheese		9.0%	21.0%	57.0%	
2-3 per week	Count		0	0	19	.000
	% within cheese		.0%	.0%	100.0%	

Consumption of Yogurt

		Count	Lockdown Phases			P-value
			LOCKDOWN 1	LOCKDOWN 2	POST LOCKDOWN	
yogurt	never		104	90	60	
	% within yogurt		44.5%	28.4%	28.4%	
rarely	Count		120	90	112	
	% within yogurt		51.2%	30.7%	47.2%	
once per week	Count		138	110	181	.000
	% within yogurt		20.1%	36.8%	40.3%	
2-3 per week	Count		31	117	70	
	% within yogurt		13.8%	52.2%	33.0%	

Consumption of Milk

		Lockdown Phases			P
		LOCKDOWN 1	LOCKDOWN 2	POST LOCKDOWN	
milk1	never	Count	31	31	5
	% within milk1	40.3%	40.3%	7.5%	.000
rarely	Count	47	23	50	
	% within milk1	38.4%	17.9%	45.7%	
once per week	Count	119	57	78	
	% within milk1	47.0%	22.7%	30.3%	
2-3 per week	Count	178	282	212	
	% within milk1	27.1%	40.3%	32.6%	
>4 per week	Count	10	10	28	
	% within milk1	20.8%	20.8%	58.3%	

DISCUSSION

Variation of dietary practices may be seen in the lockdown as the children were bound within the walls of their house and were not allowed to go out and the schools were closed due to lockdown. Children tend to get bored and they look for different activities to keep themselves occupied and one of the effects seen here will be frequent and constant snacking habits. Children tend to eat more of sweet and sugary items when compared to the normal food items at such times. Mostly the sugar types consumed were the soft and sticky and slowly dissolving types, in the form of chocolates, candies, ice cream and biscuits. Variation seen in the frequency of consumption in different phases may be due to the variation of availability of food items, in different phases of the lockdown and post lockdown, or even the absence of parents to monitor the dietary practise of the children as few of the parents had started their regular work schedules post lockdown. The frequency with which sugary foods are consumed is usually considered of greater aetiological importance than the total amount of sugars, this was in par with a study conducted by Gibsona et al²⁵. Changes in diet that is an increased consumption of fermentable type of carbohydrates leads to the increase risk of caries, this is similar to the study results done by Chikako et al²⁴. Oral hygiene habits such as brushing and regular rinsing of mouth are an integral part of maintenance of oral health, which showed improvement in the lockdown periods, may be due to the presence of parents around to constantly remind the children about the same. In a study conducted by Abdulbari et al²³ it is mentioned that The poor oral hygiene practices in Al-Hassa, Saudi Arabia, showed that lack of parental guidance and appropriate dental health knowledge with frequent exposure to cariogenic foods in addition to sociodemographics are the main risk indicators for dental decay among the children, this study hence supports the result of the present study.

CONCLUSION

This manuscript discussed (1) the variation of diet seen in lockdown phases, (2) the relative contribution of frequency and amount of sugar intake to caries levels. Most studies on the association between sugar intake and the amount of caries showed a no, a linear or log-linear association with relatively low correlation coefficients. When applying fluoride by appropriate toothbrushing twice a day, the association reduces significantly or is virtually absent. The relative contribution of the frequency versus the amount of sugar intake is difficult to discriminate because of the high correlation between frequency and amount. It is clear that the relative cariogenicity of a food is not directly correlated with the amount of sugar it contains, unless the amount is very low and it is clear that it is not

possible to estimate the minimal cariogenic concentration of sugars in foods, since this threshold varies with too many factors. Also, the types of products contributing to the intake of free and added sugars lend themselves to be skipped or to be combined to reduce the numbers of intake. In situation as seen during the COVID pandemic it becomes extremely important to maintain a proper diet of the children and also to monitor the oral hygiene practices, as the chances of stepping out and visiting a dentist were next to none. Yet, in sessions of dietary counselling to prevent dental caries, the counsellor should not forget to highlight the importance of quality tooth brushing with fluoride toothpaste and strongly support this.

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