

Capturing India's Sweet Tooth during Pandemic: Analysis of Populace Perception; Practice by Descriptive, Inferential Analysis by SPSS and GIS Choropleth Mapping

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Abstract

Indians have an immense sweet tooth. Consumption of sugar & sweet has been highly-liked and inherent part of Indian culture, religion and traditions from primeval times. In this study the survey conducted to collect information on demographic data, awareness and attitudes toward sweet consumption before and during lockdown period, this study included 203 subjects. Most of the respondents belong to same socio-demographic profile i.e. college going, non/part time working, unmarried middle class north Indian males from nuclear families. preferred khoa based sweets as their first choice. Top three sweets which were made at home by our respondents were gulab jamun (made by 54.3%), besan laddu (made by 17.3%), and ras malai (made by 14.2%).78.8% respondents gave 5 and above rating. So it can be concluded that this result is in accordance with the fact that sweets are essential and intrinsic part of Indian culture. It is observed that there is a statistically significant reduction in buying sweets During COVID19 period compared to pre COVID19.)

Index Terms: covid-19, choropleth mapping, gis, India, lockdown, survey, sweets

Introduction

Can't get through the day without a sweet delight? You are sugar-dependent like typical Indians. Indians have an immense sweet tooth. Eating sweet foods may improve our mood temporarily by making us feel happier and more energetic while also satisfying our hunger. Sweets are essential element of every Indian celebration or festivity of any kind. Consumption of sugar & sweet has been highly-liked and inherent part of Indian culture, religion and traditions from primeval times. They are made in Indian households not only for special parties and events, but also for simple merriment moments like anniversaries, birthdays, graduations or even any other reason for celebration. Every event, big or small, Indians likes to share sweets with the whole neighborhood even simply because he/she is the proud owner of a new car. There are numerous sorts of Indian sweets and their varieties. They can be classified as: Kheer and Payasams, Laddu or Ladoos, Halwas, Burfis, Kulfis, Sugar etc. Indian subcontinent has been growing sugarcane for thousands of years, and the skill of refining sugar was formulated there 8000 years ago (6000 BCE) by the Indus Valley Civilisation.

The English word "sugar" comes from a Sanskrit word sharkara for the refined sugar, while the word "candy" comes from Sanskrit word khaanda for the unrefined sugar– one of the simplest raw forms of sweet. Over its long history, cuisines of the Indian subcontinent formulated a varied range of sweets. Some claim there is no other region in the world where sweets are so varied, so numerous, or so invested with meaning as the Indian subcontinent.

In the various languages of the Indian subcontinent, sweets are identified by several names, one familiar name being Mithai (मिठाई , میٹھائی, मिठाई). They comprise of sugar, and a wide classes of ingredients such as different fermented foods, flours, fruit pastes and dry fruits, milk, milk solids, raw and roasted seeds, root vegetables and seasonal fruits. Some sweets for instance burfi are baked, some akin to kheer are cooked, some like jalebi are fried, varieties like Mysore pak are roasted, and others like kulfi are frozen, whereas still others entail creative permutation combinations of preparation techniques. The recipes and composition of the sweets and other ingredients diverge by region. Mithai/sweets are occasionally dish up with a mealtime, and often included as a form of celebration, gift giving, greeting, hospitality, parties and religious offering in the Indian subcontinent. On South Asian festivals – such as Eid, Diwali, Holi, and Raksha Bandhan – sweets are prepared at home or bought, and then distributed. Many social gatherings, wedding ceremonies and religious festivals often include a social celebration of food, and the flavors of sweets are an essential element of such a celebration.[1]

Many of the recipes for the sweets originated centuries ago with many of the sweets being cooked at home. Indians still do cook indigenous sweets at home especially if they have elders in the family who know how to make them or with the help of online content. However, majority of people buys them at “mithaiwala’s/halwai”s/sweet centres” or restaurants as take-outs or order them as gifts to be given at specific events like a wedding.

The ongoing COVID-19 pandemic is expected to put pressure on the sweet consumption patterns as there are curbs on social gatherings and outings. The industry and local sweet shops is also facing reduced in demand and consumption during the lockdown. This has even led to drop in national & international prices of sugar currently. It is expected previously with the possibility that the consumption could be further lower given the extension in the nationwide lockdown. Similarly, owing to lockdown, the global sugar market has also undergone many fluctuations and changes over the past few weeks as a result of the corona virus pandemic. [3] Although global prices are likely to remain muted at the current scenario. Hence, the overseas sales are likely to stay at levels of four Mt as against the previous target of six Mt. The overseas sale of sugar is too likely to get influenced due to drop in international prices & also because of disruption in supply chain at number of ports.

In this study, the data is analyzed to show change in consumption pattern of sweets in India, including traditional sources of sweets also. The survey collected information on demographic data, awareness and attitudes toward sweet consumption before and during lockdown period, this study included 203 respondents. The research point of view having a large sample size and therefore a greater statistical power, increase the fathering of large amount of information. Before the corona virus outbreak, we thought consumption would increase by 1% this year! At this early stage this survey was performed so that the consumption of sweet can be studied and next year once the world reverts to normal, keep this under review to increase the consumption of sweet at domestic level which will definitely help the nation to outcome with this situation. . [2]

Objectives:

The objective of this survey research study aimed

- To prepare easy to understand online questionnaire. This can assess the impact of lockdown on individuals' consumption of sweet before and during lockdown.
- To share out prepared questionnaire for the collection of public opinion data through different social media platforms like WhatsApp, Instagram, and e-mail etc.
- To examine collected data by descriptive & inferential statistical analysis from beginning to end with the help of SPSS and GIS multivariate mapping. This can measure the adjustment made by people about their eating habit during the crisis and how they are maintaining their life with lots of changes.

Material And Method

3.1 CONCEPTUAL FRAMEWORK: The method of conducting the study was as follows.

Firstly, the selection of study area was described followed by selection of sample for the study and method used for analyzing the collected data. The main aim of the present research was to assess the changes in sweets consumption patterns in the present COVID-19 scenario. The aim of the present research was describing the data which were collected and analyzed to have a better understanding changes in sweets related patterns in the COVID-19 pandemic which in turn can be used for improving the studies about sweets consumption.

3.2 Questionnaire Development

Questions made through the Google forms app and question was simple which help respondents to understand the question well. The survey was conducted through a self-administered questionnaire. It was developed and administered in English language from May 25 until 1st week of June, 2020, through the Google form application. Respondents were recruited on a voluntary basis. [4] The questionnaire consisted of 23 multiple choice questions structured in sections, related to socio-demography, sweets consumption and changes due to covid-19 pandemic. The survey was disseminated through various institutional communication channels, such as institutional website, email social media and by message.

The questionnaire is provided in Appendix A.

3.3 Selection Of Study Area

The study has been conducted online in different cities of India, The Pandemic situation of COVID-19, did not allow the researcher to visit a particular area and survey. So we developed Google forms and sent to the people residing in different parts of India.

3.4 Data Collection And Sample Size

The questionnaire was sent through different social media platforms like WhatsApp, Instagram, e-mail etc. The form was sent to 212 people. Out of 212, only 203 people responded and participated in the survey. Hence the sample size has been taken as 203.

Most of the respondents filled the structured questionnaire on the same day while some of them took few days to complete the questionnaire due to their busy work schedule, and then submitted their responses.

3.5 Data Analysis

Primary survey data analysis consisted in frequency counts and percentages, using Microsoft Excel software. Statistical significance was determined by analysis using SPSS software to obtain descriptive as well as inferential statistics of frequencies and percentage of responses and to prepare the statistical tables and graphs presented in the study.

The collected data was also utilized to prepare thematic Choropleth map with histogram to represent statistical data through various shading patterns or symbols on predetermined geographic areas (i.e. India) with the help of Q-gis software as it is good at utilizing data to easily represent variability of the desired measurement, across a region.

Results & discussion:-

4.1 Socio-demographic profile of respondents:-

Out of 203 respondents 52.8 % were female, 80.3% were from age group between 19 to 30 years and 77.2 % were pursuing graduation. As can be seen from table 1 home state of maximum respondents' i.e. 28.3 % was Bihar, 91.3 % were unmarried and 85% were still studying, 76.4 % were from <2 lakh monthly income group and 52.8 % respondents belong to nuclear family i.e. 2-4 members in the family.

It is a stated fact that, one needs a substantially unanimous sample to draw any meaningful conclusions statistically. If a sample has many socio-demographic sub-groups might trim sample downward to a collection of less relevant sample(s). These samples could then not be effective to draw any meaningful conclusions from. ^[5]

In the luminosity of this central fact socio-demographic profile of the respondents of this research is pertinent as most of the respondents belong to same socio-demographic profile i.e. college going, non/part time working, unmarried middle class north Indian males from nuclear families. Data taken from this sample is suitable to illustrate momentous conclusions.

The survey results were tabulated. This survey was taken by the people <19 years of age.

Table 1: Distribution of demographics of the study subjects

Parameter	Sub-Parameter	Percent
Gender	Not answered	1.6
	FEMALE	52.8
	MALE	45.7
Age Group	Not answered	1.6
	0-18	16.5
	19-30	80.3
	31-45	0.8
	45+	0.8
Location	Not answered	2.4
	Rural area	32.3
	Urban area	65.4
Place	Not answered	2.4
	Bihar	28.3
	Chhattisgarh	16.5
	Delhi	1.6
	Haryana	0.8
	Hyderabad	0.8
	Jharkhand	3.1
	Madhya Pradesh	4.8
	Maharashtra	1.6
	TamilNadu	3.2
	Telangana	0.8
	Uttar Pradesh	33.9
	Uttarakhand	0.8
West Bengal	0.8	
Marriage	Not answered	2.4
	Married	1.6
	Prefer not to say	4.7
	Single	91.3
Education	Not answered	3.1
	Doing Graduation	77.2
	Graduated	6.3
	Higher Secondary	9.4
	Post Graduated	3.9
Occupation	Not answered	2.4
	Employed	5.5
	Still studying	85
	Unemployed	7.1
Income	Not answered	2.4
	Less than 1,00,000	2.4
	Less than 25,000	3.1

	Less than 50,000	3.1
	More than 2,00,000	76.4
	Prefer not to answer	12.6
Number of Family Members	Not answered	2.4
	2-4	52.8
	More than 4	43.3
	None	1.6

4.2 Preferred type of indigenous sweet: As can be seen in the Table.2 44.1 % respondents preferred chhena based sweets as their FIRST CHOICE, 44.1 % respondents preferred khoa based sweets as their FIRST CHOICE, 23.6 % respondents preferred chhena based sweets as their FIRST CHOICE, and 22.8 % respondents preferred chhena based sweets as their FIRST CHOICE.

4.3 Homemade sweets consumed during lock down: The ongoing COVID-19 pandemic has put pressure on the sweet consumption patterns as there are curbs on opening of shops, social gatherings and outings. From the results we can state that to combat this situation people made sweets at home. Top three sweets which were made at home by our respondents were gulab jamun (made by 54.3%), besan laddu (made by 17.3%), and ras malai (made by 14.2%).

4.4 Frequency of consuming sweets: From the results we can state that Indians have great sweet tooth because, 11% respondents consume sweets daily twice a day after meals, 38.6 % respondents consume sweets 3-4 days in a week, 32.3 % respondents consume sweets 1-2 days in a week.

4.5 Sweets consumption necessity rating: On the Sweets consumption necessity rating scale of 1-10, 78.8% respondents gave 5 and above rating. So it can be concluded that this result is in accordance with the fact that sweets are essential and intrinsic part of Indian culture.

4.6 Preferred precautions for corona: literacy rate & socio-demographic profile of respondents reflected in the findings of questions related to preferred precautions for corona as 84.3 % preferred homemade sweets, 46.5 % prefer off the shelf sweets (supermarket sweets), 66.1% prefer buying sweets from shops which are properly sanitized and 74.8% prefer FSSAI marked packaged sweets.

Table 2: Distribution of answer to the questions

		Percent
10. Do you prefer sweets made from [CHHENA]	Missing	15.7
	FIRST CHOICE	44.1
	SECOND CHOICE	16.5
	THIRD CHOICE	23.6
10. Do you prefer sweets made from [KHOA]	Missing	10.2
	FIRST CHOICE	44.1

	SECOND CHOICE	27.6
	THIRD CHOICE	18.1
10. Do you prefer sweets made from [BESAN]	Missing	14.2
	FIRST CHOICE	23.6
	SECOND CHOICE	37.8
	THIRD CHOICE	24.4
10. Do you prefer sweets made from [BUNDI]	Missing	19.7
	FIRST CHOICE	22.8
	SECOND CHOICE	22.8
	THIRD CHOICE	34.6
11. Which homemade sweet you consumed during lock down?	Missing	3.9
	Besan ladoo	17.3
	Cake	0.8
	Dhokla	0.8
	Gulab jamun	54.3
	i dont like sweets..	0.8
	No	0.8
	None	0.8
	Nothing	1.6
	Petha	2.4
	Ras malai	14.2
	Rasgulla, milk cake	0.8
	rusgulla	0.8
	Sewai	0.8
12. How often would you say, in one week you eat sweets?	Missing	2.4
	1-2 days/nights in week	32.3
	3-4 days/nights in week	38.6
	every night/day after meal	11
	STOPPED EATING	15.7
13. If you are diabetic,	Missing	2.4
	No, I am not diabetic	81.1
	Prefer not to eat	2.4
	Prefer to eat in less amount	4.7
	You prefer eating sugar-free sweets	9.4
14. Do you prefer...	Missing	4.7
	No preference	40.9
	Off the shelf sweets/chocolate (supermarket sweets)	46.5
	Road side vendors	7.9
15. Before lock down how regularly do you buy sweets	Missing	2.4
	Daily	7.1

	Monthly	13.4
	Occasionally	41.7
	Weekly	35.4
16. How many times you are buying sweets during lock down ?	Missing	2.4
	Never	41.7
	Rarely	50.4
	Regularly	5.5
17. Do you think sweets consumption is necessary for you, rate your answer 1 out of 10	0	3.1
	1	5.5
	2	1.6
	3	6.3
	4	4.7
	5	21.3
	6	4.7
	7	13.4
	8	18.9
	9	6.3
18. In occasion during lock down would you like to prefer	Missing	3.1
	Home made sweets	84.3
	No confectioneries	7.1
	Sweets from shops	5.5
19. Do you prefer buying sweets from shops which are properly sanitized	Missing	2.4
	Don't care	1.6
	Maybe	22
	No	7.9
	Yes	66.1
20. Do you prefer FSSAI marked packaged sweets	Missing	2.4
	Don't care	3.9
	Maybe	14.2
	No	4.7
	Yes	74.8

Table 3: Comparison of the buying sweets before and during COVID19 lockdown

		N	Mean Rank	Z	Asymp. Sig. (2-tailed)
16. How many times you are buying sweets during lock down ? - 15. Before lock down how regularly do you buy sweets	Negative Ranks	118	64.34	-9.35	0.001*
	Positive Ranks	6	26.33		
	Ties	0			
	Total	124			

*Statistical significance set at 0.05

Interpretation:

Wilcoxon Sign rank Test revealed there is a statistically significant difference values observed in During COVID19 – Before COVID19 among buying sweets (P= 0.001). Indicating that the buying sweets before COVID19 (Mean rank =64.34) was higher than during COVID19 (Mean rank =26.33) and the difference is statistically significant (P= 0.001). (It is observed that there is a statistically significant reduction in buying sweets During COVID19 period compared to pre COVID19.)

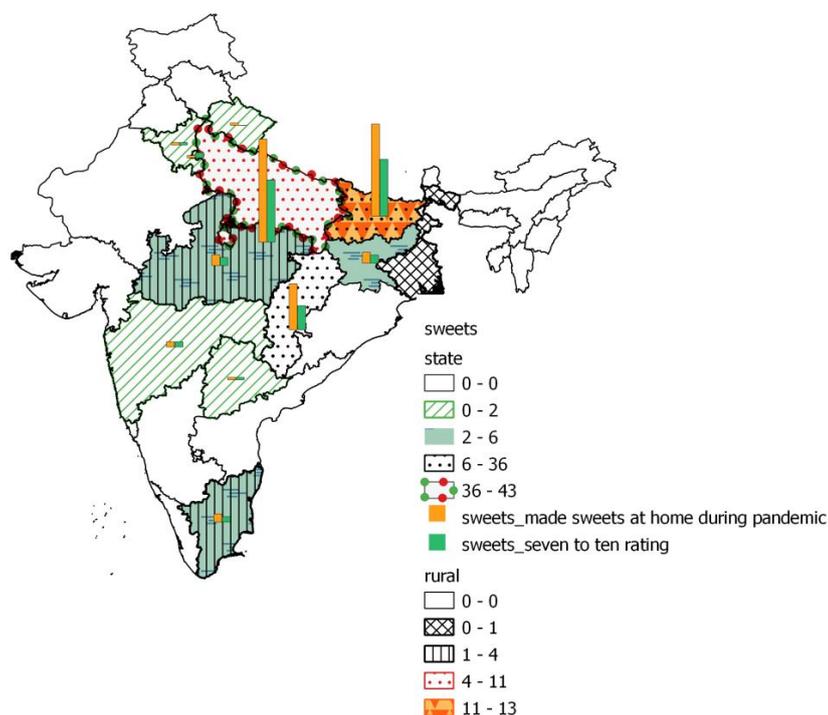


Figure: 5. 1: Choropleth Map: showing home states; belonging to rural areas of respondents and frequency histogram legend for answers to the questions regarding “**sweets made at home during lockdown and necessity of sweets on 0-10 rating scale**”

GIS multivariate Choropleth mapping: - As we can clearly state from choropleth map that majority of respondents belong to U.P. & Bihar. Populace preferred home made sweets during the implementation of lockdown is quite evident from above multivariate map

Conclusion and recommendations

The global sweet market has undergone many fluctuations and changes over the past few weeks as a result of the corona virus pandemic. We have reduced our global sugar consumption this year due to the corona virus pandemic. This means overall sweet consumption will now barely increase this year. We expect sugar consumption per capita to fall in 2020

Sweet consumption rose by about 1 Mt in the five months ended February, however sales may drop by about 1.5 million tons in 2019-20 mainly due to the lockdown that was announced in March, which cut demand. This is due to the collapse in out-of-home food and drink consumption, and the difficulties faced in operating normal supply chains.

The reductions are a best-guess at this stage and are not wholly scientific. Further modifications may be required as we learn more information. After the lockdown is over there may be some spurt in demand from traders to refill the pipeline stocks immediately."In this survey people has also cleared that they wish to eat sweet but due to lockdown, unavailability and cause of contamination the drop of sell and consumption of sweet is seen.

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