

Impact of COVID- 19 on Eating Out Culture and Sensory Priorities

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Abstract:

Purpose- The purpose of this study was to evaluate whether sensory priorities & dining out habits of the society were modified during COVID-19 pandemic outbreak.

Design / Methodology/ Approach- Data was collected from a total 304 respondents comprising frequent diners, academicians and industry practitioners. A structured questionnaire was designed through a detailed discussion with academicians & practitioners. Exploratory factor analysis was used to explore most preferred food choice variables whereas a paired sample t test was performed to assess shifts in frequencies of eat out prior and post COVID 19 pandemic outbreak.

Findings- ‘Taste and flavor of the product’ was most preferable sensory priority for food selection before pandemic. However, this priority has been replaced by hygiene, cleanliness, zero touch points and contactless order due to COVID-19 pandemic. Newly emerged most preferred food choice variables include touch less consumer experience, sanitized restaurants, food safety certifications, contactless order, health and hygiene. Restaurants had to reframe, restructure their SOPs and strategies to gain the confidence of the customers as an outbreak of a pandemic disrupted lifestyle whereas consumption pattern, dining habits of consumers were modified.

Originality/value- This study reveals the modified dining out habits and conscious consumption led to changed sensory priorities, as a strategy to recover from a worldwide epidemic and transition to a “new normal” phase of the service sector.

Keywords: Eating out, Sensory Priorities, Food choice, Covid-19, QSR, Social Distancing



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1. Introduction

Restaurant industry went through many dramatic changes over the last few years such as emergence of fast food and fine dining, online orders and payment through various food ordering, Self-order kiosk (Na et al.,2021) and delivery platform etc. (Preetha & Iswarya, 2019, Thamaraiselvan et al., 2019). This added a considerable convenience and comfort to the life of families (Karsten et al.,2015) and food lovers who prefer a variety of the specialty cuisines. Our young generation is driven by celebrating festivals and special occasions, hanging out and dating with their friends (Paddock et al.,2017) This has become their regular routine which shaped up their eating out habits (Goyal et al.,2007). Consumer decisions are driven by many set of parameters which are complex in nature (Lorenz & Langen, 2018). The changing demographics, increased income, urbanization, digital revolution, use of technology, local approach of international restaurants in menus and changing consumer preferences are driving F&B sector (Kearney, J. ,2010 ; Anand,R.,2011). This sector has observed tremendous growth at 11% Compound annual growth rate (CAGR) during 2015-16 to 2018-19 (NRAI IFSR 2019 report) i.e before pandemic.

Restaurants with this folded growth, shattered by an uncertain future due to pandemic Covid 19. The F & B industry was the first one to get a hit after announcement of lockdown as it completely relies on the spot cash flows. Due to Covid hit, restaurants that used to flood with food lovers, diners who used to wait in long queues to experience those special moments with their friends and loved ones in presence of their favorite food had to rely on home deliveries. There was a time when for effectively managing these long waiting lines various operational strategies like table management (Tse & Poon, 2017), models like mathematical model for revenue enhancement (Tang et al.,2019; Koh et al., 2020) were suggested. Diners used to prefer eating out mostly on special occasions (Paddock et al., 2017; Gursel et al.,2019) over online orders, getting home deliveries and take away. Dining out used to give motivation, gain pleasure and ultimately it used to have a long lasting impact on quality life (Oh.H.J et al., 2014). But during pandemic social dine-in has been replaced by social distancing (Yost & Cheng, 2021; Wei et al., 2021).

This study is an attempt to understand the impact of Covid -19 pandemic, which essentially demanded social distancing, on the growing culture of eating out in consumers and determinants of food choices/ restaurant selection. The research aimed: -

- 1) To study an impact of the social distancing culture created by Covid-19 pandemic on eating out habits.
- 2) To explore various food choice attributes used by customers as selection parameters, pre and post Covid 19 pandemic.



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Volume XXX
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- 3) To find out the most concerning factors for diners for selection of food items after Pandemic.

This study focuses on exploring changing habits of diners and sensory priorities through a structured questionnaire. Next section briefs about the literature review & hypothesis development followed by methods. Thereafter, data analysis & results of the study are discussed. Finally, at the end, the paper offers the conclusion & limitations of the paper.

2. Literature Review

2.1 Dining Out Dimensions:

While going out to dine in the neighborhood, some customers return to well-known restaurants because they liked their prior eating experience and want to recreate it. Such loyalty frequently develops into a behavior that is repeatedly practiced (Roberts & Shea, 2017). However, Richardson et al. (2019), examined the influence of dining experience on customer's overall satisfaction and their intentions to revisit the Quick Service Restaurant (QSRs). Dining experience parameters such as quality of food and services offered by QSRs and convenience were strong predictors of satisfaction and revisit, whereas ambience doesn't have a direct effect on customer satisfaction. Additionally, "Social Modeling " was identified as a prime factor of eating out behavior although diners use other people's eating pattern as a reference for the kind and quantity of food (Cruwys et al., 2015). Consequently, Higgs, S. (2015) indicated social norms as one of the major reasons for influencing eating behavior and food choices. Social norms may alter self-perception or/and sensory evaluation of food. Furthermore, Van der Horst et al. (2011) explained the contribution of various factors such as time spent, efforts required, cooking time and skill that influenced fast food consumption / takeaway of food. Beldona et al. (2010) explained the major role of two highly important and relevant constructs namely "Customer Involvement and Variety Seeking". Wright et al. (2001), highlighted the importance of cultural setting in framing preferences towards food taste. But due to Covid-19 pandemic, the fast moving restaurant industry took a U turn & pressed a pause button. As public health was prime objective, isolation & social distancing modified dietary and physical activity habits (Ammar et al., 2020). Significantly more people preparing their own meals, eating breakfast every day, and consuming less fast food was reported by Di Renzo et al., 2020. Recently, Nielsen, a media company, conducted a survey of 11 Asian markets, wherein they highlighted consumers ' thought process on reprioritizing their eating habits as an impact of Covid 19 pandemic. Therefore, we put forth following hypothesis statement:

H1: Eating out habits of consumers has been changed as an impact of the social distancing culture created by Covid-19 pandemic.



According to literature review, Food Taste (Goyal, A., and Singh, N. P.,2007; Onwezen et al., 2012; Nakata, R., & Kawai, N.,2017; Reed et al., 2019), food quality (Klaus G. Grunert, 2005; Goyal, A., and Singh, N. P.,2007; Sadiliek T., 2019), sensory Appeals (Lindeman M. and Vaananen M.,2000; Prescott et al., 2002; Ares, G. and Gambaro,A., 2008; Fotopoulos et al., 2009; Carrillo et al., 2011; Januszewska et al., 2011; Milošević et al., 2012; Rahman et al., 2013; Cabral et al., 2017; Pearcey, s. & Zhan, G., 2018), health & convenience (Steptoe et al., 1995; Prescott et al., 2002; Januszewska et al., 2011; Milošević et al., 2012; Onwezen et al., 2012; Cabral et al., 2017) ,ambience and hygiene (Goyal, A., and Singh, N. P.,2007; Anand R., 2011) were some of the prime parameters, that were considered by diners before Covid-19 Pandemic.

Boesveldt, S. and Graff Kees (2016), focused on smell and taste aspects which help to induce eating rate with perfect food texture whereas Fisher et al. (2016), highlighted health concerns in a long term period as a result of the food choices. Furthermore, Machin et al. (2014), identified the influence of context on food choice motives. FCQ was used to study the essence and impact of various factors on food choice. “Price”, “Perceived quality” and “Freshness” of food dimensions were with highest cognitive salience, however “Convenience” and “Variety” were the most relevant dimensions for the consumption context. Additionally, Clemes et al. (2013), studied the role of ethnic food and its increasing worldwide demand. They identified five major significant factors influencing choice of restaurant, namely “Dining experience”, “Social status”, “Service quality”, “Food quality” and “Value for money”. However, Anand, R. (2011), highlighted passion for eating out and socializing. “Ambience and taste” for students, “Convenience” for dual income families were identified as primary determinants of food choice of consumers. He also focused on growing trends of green and organic food taken into consideration as health parameters. But later on, Covid-19 brought health parameters on a priority & rest all fell in the list after health related parameters only. This give rise to the next hypothesis:

H2: Food choice attributes used by customers as selection parameters are differed amidst Covid 19 pandemic outbreak.

and

H3: Selection of food items is controlled by the concerning factors due to Covid 19 pandemic.

3. Method

3.1 Participants and Procedures

A sample of 304 respondents actively participated in an online survey. A random sampling method was used for this survey. Survey questionnaire was forwarded to



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Volume XXX
Issue-5 | October 2022

more than 375 respondents, who were above 18 years and prefer to eat out/dine out. Out of approx. 375 respondents, the survey could fetch 304 (81.06%) valid responses.

3.2 Data Collection

Through a detailed discussion with the academicians and practitioners, a structured questionnaire was developed. This questionnaire was divided into 4 parts. First part focused on demographic characteristics of respondents, frequency of visit to the QSRs before lockdown and after lockdown and eating out preferences. Second part concentrated on understanding the priorities of customers for selection of QSRs through Likert scale where 1= Strongly Agree and 5= strongly disagree. Through the third part of the questionnaire, respondent’s sensory priorities were ranked from 1st choice to 5th choice in both cases that is before lockdown and after lockdown, where as in fourth part of the questionnaire, Likert scale was used to evaluate post lockdown preferences of the respondents towards selection of QSR.

4. Data Analysis and Results

4.1 Normality & Reliability Check

The collected data was first subjected to check the normality where values of skewness and Kurtosis were calculated. Maximum absolute value of skewness = 1.898 and maximum absolute value of Kurtosis = 3.738. As recommended values are skewness < 2 and Kurtosis < 7 (Curran et al.,1996), hence data normality is verified. The Cronbach’s alpha for the 17 items is 0.904. This suggests the high internal consistency among the items.

4.2 Demographic Analysis

The demographic aspect of the respondent is explained in Table 3 wherein more than 50% of respondents (53.6%) were in the age group of 18-25 Years, 21.7% respondents were from 26-35 Years age group, 20.7 % respondents were from 36-45 Years age group. Very few respondents responded from 46 and above age group people where 3.3% were from 46-55 Years and only 0.7% were 56 Years and above.

Table 1.

Demographic characteristics of respondents. (n=304)

Age			Occupation		
	Participants	(%)		Participants	(%)
18-25 Years	163	53.6	Student	129	42.4
26-35 Years	66	21.7	Salaried	135	44.4
36-45 Years	63	20.7	Self Employed	17	5.6
46-55 Years	10	3.3	Professional	19	6.3

56 and Above	2	0.7	Homemaker	4	1.3
Gender			Marital Status		
Female	159	52.3	Married	107	35.2
Male	145	47.7	Unmarried	195	64.1
Edu.Qualification			Income		
Upto HSC	10	3.3	Upto 20000	37	12.2
Undergraduate	61	20.1	20000-50000	80	26.3
Graduate	58	19.1	50000-100000	83	27.3
Post Graduate	165	54.3	100000 and Above	104	34.2
Other	10	3.3			

4.3 Descriptive Analysis

Table 2.

Descriptive Statistics of Variables

Items	Mean	Std. Deviation	Cronbach's Alpha
Sensory Priorities-			
Touch less customer experience	1.98	1.284	0.965
Up to the mark sanitization level	1.86	1.287	
Sanitized public places in restaurants	1.87	1.309	
Food Safety Certifications	1.99	1.307	
Zero touch contactless order/ Personalized service	1.95	1.322	
Hygiene and cleanliness / Ambience	1.66	1.264	
Safe Dining experience / Cost efficiency	1.91	1.256	
Healthy food menus	2.20	1.284	
Fresh and hygienic food / Variety of menu	1.67	1.267	
Self-service kiosk	2.23	1.331	
Safety Assurance			
Open kitchen restaurants to ensure hygiene and sanitation.	1.64	.817	0.720
Less no. of table and seating capacity	1.88	.916	
Display CCTV camera / live video to confidence	1.54	.735	
Restaurants applying all precautionary measures and NOC certifications.	1.58	.689	



NMIMS
Management Review
ISSN: 0971-1023
Volume XXX
Issue-5 | October 2022

Health Parameters			
Social distancing following restaurants	1.45	.633	0.510
Hygiene preference over specialty of restaurant	1.31	.542	
MNC preference over local food	2.75	1.113	

In order to evaluate the internal consistency of the various constructs, Cronbach alpha coefficients were utilized. With 10 elements, the construct of sensory priority has a very high Cronbach alpha of 0.965, indicating extremely good internal consistency among the construct's items. While the health parameter construct has the lowest Cronbach alpha, at 0.510, the second construct, safety assurance, also has very strong internal consistency. The most important factors at the individual level are hygiene preference over restaurant specialty (1.31) and social distance following restaurants (1.45).

5. Results and Discussion

5.1 Eating out Habits (Hypothesis 1)

A paired sample t-test was performed to examine the effect of the Covid-19 epidemic on consumers' dining out patterns. The frequency of visits pre and post pandemic is used to gauge eating out behavior. To determine if there is a statistically significant difference between the means of visit frequency before and after the lockdown due to the Covid-19 epidemic, a paired sample t test was used.

Significance value of paired sample t test was 0.000 which is $< .05$ with 95% of confidence level. The results of the paired sample t test were significant with P value of 0.000 which was less than 0.05, indicating that there is a significant increase in mean (1.243) and Std. Deviation(1.886), with 95% confidence level. This indicates that eating out habits of the customers got reshaped and reframed due to Covid-19 which essentially demands social distancing. Covid-19 pandemic replaced social dine in opportunities with social distancing threat. The Covid-19 pandemic & imposed restrictions became the prime reason for closure and severe losses borne by the overall restaurant industry (Brizek et al.,2021). Customers' comfort level while eating out and preferred dining settings were the mediating factors for eat out decisions during the epidemic. Based on perceived risk & perceived trust factors, customers were willing to spend more (Jeong et al., 2021).

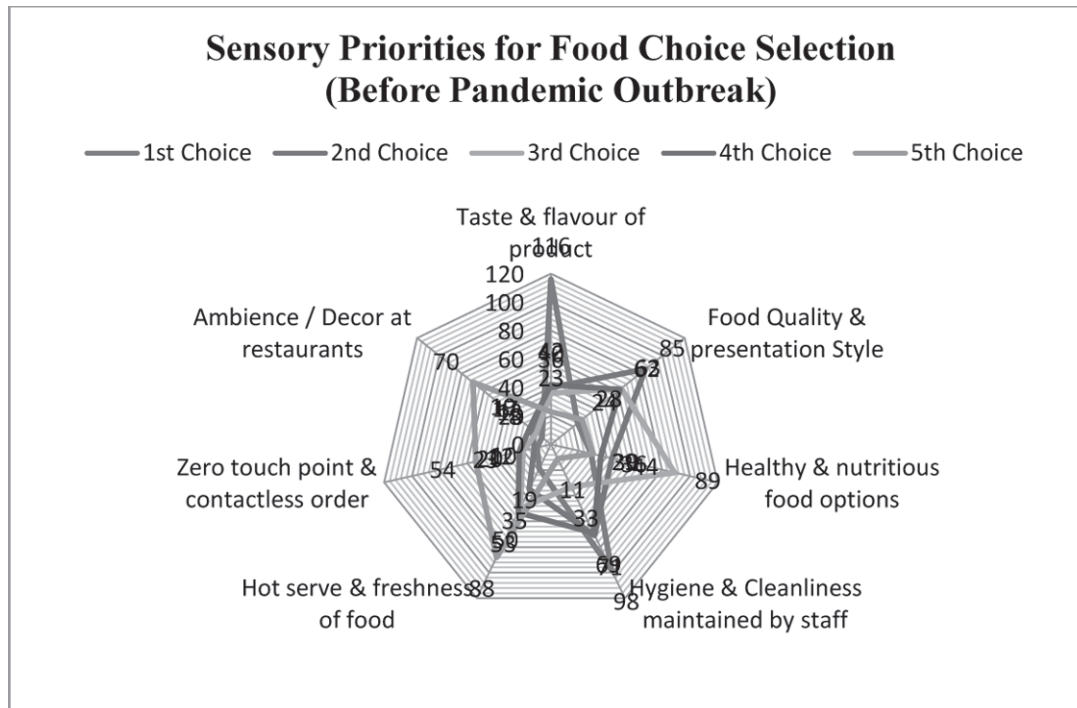
5.2 Sensory priorities of food choice before and after pandemic conditions (Hypothesis 2)

Spider charts were used to analyze the priorities of food choice attributes in pre & post pandemic conditions. To investigate consumer preferences toward these sensory priorities while selecting a food of choice before and after the epidemic, the major



7 features were chosen- Taste and flavor of product, Food Quality and presentation Style, Healthy and nutritious food options, Hygiene and Cleanliness maintained by staff, Hot serve and freshness of food, Zero touch point and contactless order, Ambience/Decor at restaurants.

Figure 1



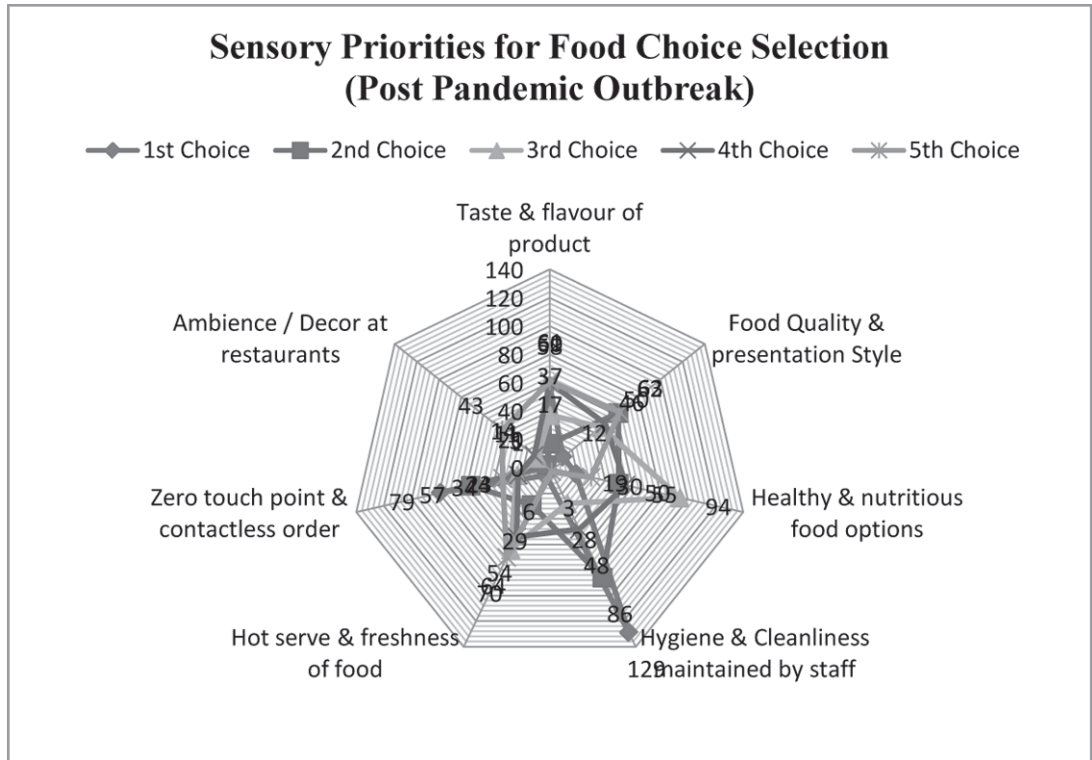
Spider Chart for Sensory Priorities for Food Choice Selection (Before Pandemic Outbreak)

Prior to lockdown, taste and flavor of the product was the primary selection criterion, followed by staff hygiene and cleanliness whereas, Food Quality and Presentation Style was the second most popular choice among consumers, followed by Staff Hygiene and Cleanliness and Healthy and Nutritious Food Options.



Figure 2

Spider Chart for Sensory Priorities for Food Choice Selection (Post Pandemic Outbreak)



Priorities for Food Choice Selection (Post Pandemic) shows that staff hygiene and cleanliness were the top selection factors followed by zero touch points and contactless ordering. Further healthy and nutritious food, Hot serve and freshness of food were considered to be next selection criteria which was the least preferred attributes in normal time. The least preferred attribute was Food Quality and presentation Style, which was the first priority for customers during normal time.

Table 3.

Sensory priorities of food choice before and after pandemic conditions

	1st Choice		2nd Choice		3rd Choice		4th Choice		5th Choice	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Taste and flavor of product	116	58	40	17	36	37	42	60	23	61
Food Quality and presentation Style	24	12	85	62	63	46	62	50	28	63

Healthy and nutritious food options	29	19	44	50	89	94	36	55	30	30
Hygiene and Cleanliness maintained by staff	98	129	71	86	33	28	69	48	11	3
Hot serve and freshness of food	19	6	35	29	50	64	53	54	88	70
Zero touch point and contactless order	10	79	12	57	20	24	23	23	54	34
Ambience / Decor at restaurants	8	1	17	3	13	11	19	14	70	43

A comparative study of sensory priorities as in Table 6 indicates –

- Before Pandemic, Taste, flavor of the product and hygiene, cleanliness maintained by staff were the 1st priority options for the majority of customers. At the same time, hot served fresh food and ambience/ décor at restaurants were the last priority for the majority of customers.
- Post Pandemic, 1st priority of customers, i.e. taste and flavor of the product was replaced by hygiene, cleanliness and zero touch point and contactless order and that became the 1st priority for majority of the customers. Hot served fresh food continues to be the last priority for most of the customers whereas food quality, presentation style and taste, flavor of product are also last priority for most of the people.

As the entire world struggles for survival due to the pandemic, customers prefer to have hygienic food over tasty, quality food with zero touch points and contactless order. Keeping these things in mind, restaurant operators started bringing few changes in their menus which cope with the changing priorities which are revolving around hygiene & social distancing. Jeong et al., 2021 found restaurant dining environment, communication and hygiene, as crucial predictors of patrons' during Covid 19.

Concerning factors for selection of food items (Hypothesis 3)

Table 4.

Rotated Component Matrix	Component			
	Factor 1	Factor 2	Factor 3	Factor 4
Touch less customer experience	0.918			
Up to the mark sanitization level	0.912			



Sanitized public places in restaurants	0.9			
Food Safety Certifications	0.885			
Zero touch contactless order	0.884			
Hygiene and cleanliness	0.882			
Safe Dining experience	0.88			
Healthy food menus	0.838			
Fresh and hygienic food	0.837			
Self-service kiosk	0.774			
Open kitchen restaurants to ensure hygiene and sanitation.		0.795		
Less no. of table and seating capacity		0.744		
Display CCTV camera / live video to gain confidence		0.711		
Restaurants applying all precautionary measures and NOC certifications.		0.594		
Restaurant visit before lockdown			0.765	
Restaurant visit post lockdown			0.754	
Frequency of home delivery/ takeaway/ drive through			0.685	
Social distancing following restaurants				0.778
Hygiene preference over specialty of restaurant				0.69
MNC preference over local food				0.513

Total of EigenValues	7.70	2.74	1.76	1.10
Percentage of variance explained	38.51	13.68	8.82	5.39
KMO	0.91			
Bartlett's test of sphericity*		*4062.57		
df		190		
Total of Variance explained		66.40		
* $p < .05$				

Exploratory factor analysis was performed using the principal component analysis type of extraction method with varimax rotation method. Rotated component matrix signifies 4 components with a cutoff point of 0.40. Table 7 indicates data suitability for the structure detection in factor analysis. KMO measures of sampling adequacy is 0.905 which is > 0.5 and it is significant. This indicates that factor analysis would be useful for the data. In Bartlett's Test of Sphericity, $P < 0.05$, which is also statistically significant. There are 4 components explaining 66.399% total variance. Factors having eigenvalue more than 1 are considered significant. So, the results indicate that there are 4 distinct constructs with the eigenvalue more than 1 out of 20 components.

Sensory Priorities

To identify the load of each attribute of Food and restaurant selection & its relationship with the other factors, factor analysis was performed (Table 7). Touch less customer experience is a factor with the highest loading. It indicates that out of all sensory priorities, considered for the study, touch less customer experience is the top priority attribute for the customers.

In the first construct, all rest sensory priorities such as up to the mark sanitization level, sanitized public places, certified restaurants, zero touch / contactless order, hygiene, safe dine in, healthy food, fresh and hygienic food and self-service kiosks are highly correlated. Past study indicates Food Taste (Goyal, A., and Singh, N. P.,2007; Onwezen et al., 2012), sensory Appeals like taste, smell, food presentation, nice look (Lindeman M. and Vaananen M.,2000; Prescott et al., 2002; Ares, G. and Gambaro,A., 2008; Fotopoulos et al., 2009; Carrillo et al., 2011; Januszewska et al., 2011; Milošević et al., 2012; Rahman et al., 2013; Cabral et al., 2017)and ambience, hygiene (Goyal, A., and Singh, N. P.,2007; Anand R., 2011) as important sensory priorities ; which were replaced by touch less experience, sanitization level, hygiene due to pandemic situations.

Safety Assurance

In the second construct, four factors formed a construct namely- restaurants with open kitchens to ensure hygiene, restaurants with reduced number of tables and seating capacity, restaurants with CCTV cameras and live video and NOC certificate to gain customer's confidence. Majority of the restaurant studies have been done on sensory appeals, health parameters whereas Food safety parameters (Grunert K.,2005) and risk perceptions (Rahman et al.,2013; Cabral et al.,2015) were also focused in few. Safety assurance of diners has become a priority need now due to Covid-19.

Eating out frequencies and home deliveries

Third construct includes eating out frequencies before and after pandemic and



NMIMS
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Volume XXX
Issue-5 | October 2022

frequency of home delivery /take away/ walk through. Prior to the Covid-19 outbreak, the majority of diners preferred social dining over takeaway or delivery service of meals, however the NRAI IFSR Report (2019) indicates that preference has shifted significantly as a result of the pandemic. However Online orders were less likely to be placed by respondents who had a greater perceived risk, less interest in the product, and a lower anticipated profit from Online Food Delivery (OFD) services (Mehrolina et al., 2020). Based on perceived risk & intentions to purchase, consumers decide or take a final call on purchase be it online or offline. Theory of reasoned action (Fishbein & Ajzen, 1977) is a widely used theory to predict the behavior of customers under certain circumstances. During & post pandemic timeline, due to high perceived risk related to health concern, customers were very volatile in their actions. As a result of lockdown, health concerns, high mortality rates, customers had to shift to online buying. So even though they were skeptical earlier regarding online purchase & transactions, they had to shift their action of purchase with the more critical reason responsible for it.

However Planned behavior theory (Ajzen,I., 1991) brought more critical perspectives to the limelight. As pandemic demanded social distancing, health & hygiene customers were more inclined towards more protective behaviors, healthy food habits, and having homemade food. So, even in new normal, customers developed healthy habits & were more inclined towards healthy food.

Health Parameters

Last construct includes 3 factors and they are social distancing, hygiene and preference towards MNC over local. Restaurants many times have been questioned for their hygiene maintenance & sanitization standards. Covid-19 pandemic showcased the cracks and gaps that need to be filled specially in the unorganized restaurant sector. Health and hygiene parameters (Steptoe et al., 1995; Prescott et al., 2002; Januszewska et al., 2011; Milošević et al., 2012; Onwezen et al., 2012; Cabral et al., 2017) focused on healthy menus, nutrition, vitamins and mineral contents of food. But Covid-19 pandemic made all restaurant owners think and revise their operating ways. The Health ministry released Standard Operating Procedures (SOPs) for all restaurants. As a result, diners can now witness contactless ordering, digital menu cards, cashless payments, use of robots and importantly health menus.

The restaurant industry should enforce a few strict rules that would be beneficial for survival in the long run and prepare the restaurants for the future to facilitate the smooth operation of the industry in order to deal with changing consumer eating habits, perceived risk and perceived benefits. Customers get engaged in self-protective behavior whenever they perceive risk in the environment whereas this behavior intensifies dramatically during illness epidemics. The Health Belief Model



(HBM) is a widely accepted theory to explain health-related behavior as a compass for behavioral health interventions (Maiman & Becker, 1974). This model focuses on individual ideas, attitudes, and behaviors and may be utilized to comprehend consumer purchasing behavior during the pandemic.

The best practices that need to be implemented to deal with perceived risk by industry can be: Operational level safety such as seating arrangements and Ordering queue, Cleanliness and sanitation of staff and premises, Healthy habits like regular use of hand wash and sanitizer, Healthy food menus (Inclusion of healthy menus, Display of Nutrient content & calories gained, Customer friendly operations like digital menu card, digital payment and home deliveries and pick up.

Basic framework/SOPs need to be designed by restaurant and government to deal with such contingencies. Restaurant Associations & Government should keep some funds to deal with these epidemic

Conclusion, Limitations and Future Scope of Study

Covid-19 has twisted the scenario of the restaurant industry and reshaped eating out habits of the customers. The present work highlighted qualitative insights on eating out habits and customer priorities towards the food choice attributes as an impact of Covid-19 pandemic. Sensory priorities of diners' taste, flavor of the product and hygiene, cleanliness were replaced by hygiene, cleanliness and zero touch point and contactless order. Restaurant industry should design a SOP to deal with such sudden attacks of contagious diseases. The restaurant industry has to gear up with innovative ways of approaching and reaching out to the customers considering health and hygiene as a priority. This study does not generalize the outcome. It may differ for the unorganized food industry & at the different locations. Based on these studies and changing dining out preferences, one can think of developing an ideal service model for a post pandemic restaurant industry.

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6. CONFLICT OF INTEREST

The authors state that there was no sponsor participation in the study that would have impacted the findings.



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The researchers claim that no sponsors had any role in the study that would have impacted its findings.

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NMIMS
Management Review
ISSN: 0971-1023
Volume XXX
Issue-5 | October 2022

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Volume XXX
Issue-5 | October 2022