Changing Diets And Food Choices: An Empirical Study On Awareness And Behaviour Of Consumers In India

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I.   INTRODUCTION
Availability of safe and nutritious food is an important component of human wellbeing. Food security was included in the list of Millennium Development Goals as well as in the Sustainable Development Goals identified by the United Nations. Meeting the nutritional requirements of all people in the world is not only important in itself, it is crucial to the achievement of other goals, such as improving health and eradicating poverty. While efforts are being made to improve food security on the one hand, threats to attainment of the goal are being posed by factors such as rising population, environmental degradation, especially water stress, climate change, diversion of agricultural land to non-agricultural use, political instability due to wars and internal conflicts and economic downturns. In recent years, the COVID-19 pandemic has had profound implications for food security and nutrition, having affected"... food systems and threatened people's access to food via multiple dynamics " (HLPE 2020). FAO estimates that between 83 and 132 million additional people will experience food insecurity as a direct result of the epidemic due to lower incomes and higher food prices (FAO, 2020). The United Nations Secretary General, Antonio Guterres, has warned that the Russian invasion of Ukraine could cause a severe and enduring food crisis. He warned that the combined effects of the invasion, climate change and the pandemic threatened to "tip tens of millions of people over the edge into food insecurity followed by malnutrition, mass hunger and famine" (Murphy, 2022). While these factors operate at levels beyond the control of individuals, at another and more personal level, food security can also be affected by factors like shifts in dietary preferences. This paper seeks to establish whether food preferences in India are changing, the nature of these changes, and the implication of these changes for food security, food safety and nutrition.

Food security and nutrition
The World Food Summit in 1996 defined food security as the condition "in which all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life." The first step towards food security is the production of sufficient food to meet the needs of a population. Next, household level food security can be achieved only when household incomes are high enough to ensure economic access to adequate food. Feeding practices, food preparation and intra-household distribution of food further determine the nutritional status of individuals. It is abundantly clear that availability of food is not a simple matter of demand and supply. In a globalised world, complex processes influence the production, distribution, pricing and trading of food, ultimately determining who gets what, how much and where. Needless to say, these processes work to the advantage of the rich at the international, national and local levels, depriving the poor of adequate food and nutrition. However, beyond these processes, individual preferences too can affect a person's nutritional status. Food preferences of individuals are conditioned, to a large extent, by their culture, attitudes and beliefs. Interaction with others too can consciously or subconsciously affect eating habits and attitude towards certain food items.

Encyclopaedia Britannica defines food as a substance consisting essentially of protein, carbohydrate, fat and other nutrients used in the body of an organism to sustain growth and vital processes and to furnish energy. Food therefore, does not just fill the belly, it also nourishes the body, provides energy and improves

health. The nutritive value of food refers to its ability to fulfil the above functions. If food fails to provide nourishment and to protect and enhance health, it cannot be seen as contributing to food security. Food that is low in nutritive elements (like fibre, protein, vitamins and minerals) and high in calories (from sugar or fat, or both) is commonly described as junk food. Junk food often also contains artificial additives that enhance its taste and visual appeal. Consumption of such sugary and fatty food brings to the consumer a feeling of pleasure and relaxation as it causes their brains to release neurotransmitters like dopamine and oxytocin (Gearhardt and Schulte, 2021).

II.   Objectives of the Study

It is a common perception that in recent decades, rising incomes and lifestyle changes and the easy availability of food related information from various sources have changed the dietary preferences of middle-class families in India. Rising incomes have ensured economic access to sufficient food. More disposable incomes have made it more common to eat out or order food from home delivery service. At the same time, as lifestyles get busier, there is a growing preference for packaged food that is ready to eat or easy to prepare (like instant noodles and pasta). Exposure to global cultures has encouraged people, especially from the younger age groups, to try out newer cuisines. Powerful and persuasive advertising aims to influence people's eating habits by playing on their emotions and vanity. On the other hand, some individuals are becoming conscious of what they eat as they want to maintain a certain body weight or shape or are generally keen on adopting a healthy lifestyle. All these factors are changing the dietary preferences of people and this paper seeks to study these changes. The objectives of this empirical study are to

- To understand the changing food preferences among consumers in India
- To study the relationship between consumer awareness about food and their eating out habits.
- To study the impact of demographic factors age, gender, income, and education on the food habits (regarding- preferences for foods like junk foods or those which are considered 'not so healthy')

III.   Review of Literature

A study by Law, Fraser and Piracha (2020) studies the changes in preference for cereals in Indian diets and found a decline in their consumption. They believed that this could lead to a decline in the nutritional quality of Indian diets. On the other hand a survey by Deloitte (2022) found an encouraging trend towards conscious eating, healthy snacking, preference for millets and non-native foods, including exotic vegetables. Kumar and others (2022) found that globalization, urbanization and rising incomes had led to an increase in the consumption of sugar, salt, refined carbohydrates and artificial ingredients by urban middle-class Indians, which was having a negative impact on their health. Kaur and others (2016) too found that rapid urbanization and changes in cultural practices of middle-class Indians had altered their food habits. Studying the trend in purchase of processed foods and beverages in urban India, Law and others (2019) found that the rate of growth was highest in the sale of sweet and salty snacks.

IV.   Research Methodology

The empirical study is based on primary data collected through a questionnaire-based survey conducted via Google forms in 2022.

Survey Instrument

The questionnaire consisted of a set of 20 questions. The first set of questions elicited basic information about the participants. The next set of questions was related to their diets, with emphasis on differences in the composition of their diets and those of their parents, especially with reference to the consumption of meat, fast food, packaged food and commercially produced food. The last set of questions were related to their perception of the connection between food and health and how this influences their food consumption.

Statistical Techniques Used: The primary data collection began with convenience sampling and snowballing led to more random element in the sample. A total of 175 responses were analysed using Microsoft EXCEL and SPSS (version 25). An exploratory factor analysis was performed to extract latent variables awareness (AWARE) and behaviour (BEHAV) from the statements based on Likert scale.

Profile of respondents

The respondents belong to different gender, age and income. The proportion of male and female respondents is 52% and 48% respectively and none of the respondents identify themselves as belonging to a gender other than these.The minimum age was 18 as the authors believe that the food preferences of person's below the age of 18 are influenced by their parents. The respondents have been categorised into four age groups.

Income has a bearing on food choices. Eating out or ordering in is more expensive than eating home cooked meals. On the basis of household income respondents have been categorised into 4 groups: monthly income below Rs. 25000; monthly income between Rs. 25000 and 50000; monthly income between Rs. 50000 and 1 lakh; and monthly income above Rs. 1 lakh. All respondents were well educated. 24% of them had studied till grade, remaining graduates and above. Table 1 gives the profile of the sample with respect to gender, age, income and educational qualification.

TABLE 1 Demographic Profile of Sample

Gender	N (%)	Age	N (%)	Monthly Household Income	N (%)	Education	N (%)
Male	95 (54)	18-25	75(43.3)	Up to 25000	27(15.6)	Class 12	42(24.3)
Female	78(46)	25-35	26(15)	25,000 to 50,000	4(2.3)	Graduate	68 (39.3)
		35-50	45(26)	25000 - 50000	34(19.7)	Post-Graduate	35(20.2)
		Above 50	27(15.6)	.3)More than 1 lakh	55(31.8)	Professional	14(8.1)
Total	173(100)	Total	173(100)	Total	173(100)	Total	173(100)
Source: primary data							

Analysis

After organising the data and cleaning for duplicate and incomplete (unengaged) responses, sample of 173 was analysed with respect to different aspects of food choices and consumption.

Food Choices and Dietary Preferences: Pattern and Change

An analysis of responses reveals that a third of the respondents felt that their meals were somewhat or very different from the meals consumed by their parents. An analysis of meat consumption data and GDP for 120 countries between 1970 and 2007 found that increased income is initially accompanied by an increase in the proportion of animal-based food in diets, but after a certain level of income, average meat consumption begins to stagnate or even decline (Vranken et al, 2014). As many as 37% of the respondents are vegetarian. Of the remaining respondents, 26% report that the frequency of meat consumption by them was the same as that of their parents. Nearly a fifth (21%) of the respondents consume meat more frequently than their parents while 16% consume meat less frequently than their parents. That there is a rise in the consumption of meat by Indians is evident in data collected by the National Family Health Survey (NFHS). The Report of the NFHS 3 (2005-6) showed that 23.9% men and 32.6% women reported that they had never consumed any kind of meat. In the fourth survey by NFHS (2015-16) this proportion had declined to 21.6% for men and 29.4% for women. In 2019-20, the fifth round of the NFHS found that the percentage of men who had never consumed any type of meat had declined further to 16.6% while the corresponding figure for women remained nearly constant at 29.9%. A study from Karnataka shows "clear evidence of significant improvement" in the growth of children who are given eggs as part of their mid-day meals (Barman, 2022). On the other hand, change in the consumption of meat has a very significant impact on the environment and on the food production system. Livestock agriculture requires a heavy input of land, water and energy resources, leading to deforestation, air and water pollution and biodiversity loss. Diversion of food grains for use as livestock feed reduces their availability for human consumption, leading to a rise in food prices, thus impacting food security at a global level. For instance, increase in meat consumption in China created a demand for corn and other feed grains. According to a study (Ghose, 2014), while in the 1960s, 80% of corn in China was used to feed humans, by the second decade of the 21st century, 70% was being used as livestock feed. Likewise, demand for soybeans to feed animals was encouraging soy cultivation in Brazil, making it a significant contributor to mass deforestation in the Amazon (Oliveira and Schneider, 2016). A similar change in Indian dietary practices could have far reaching consequences for global food security and environmental sustainability.

A major shift in eating habits is the frequency of consuming commercially produced food. In the sample under study, almost a third (32%) of respondents believe that they eat out or order in more frequently than their parents while the remaining feel that the frequency is either less or the same. Yet there is a clear preference for food made at home. More than 4 out of 5 respondents (82%) say that they do not like to dine out or order in. However, 18% of respondents say that they consume commercially produced food twice a week or more often.

Unhealthy food is often believed to be the one that is high in calories such as fried foods, or high in use of saturated fats or similar ingredients. But there are other such foods that a lot of people either presume to be not so unhealthy or are an integral part of daily lives by choice. These include packaged foods such as biscuits,

namkeens that are readily available for munching. This category also includes ready to eat foods like instant upma, instant foods such as rajma rice or chhole rice, ready to eat noodles etc.
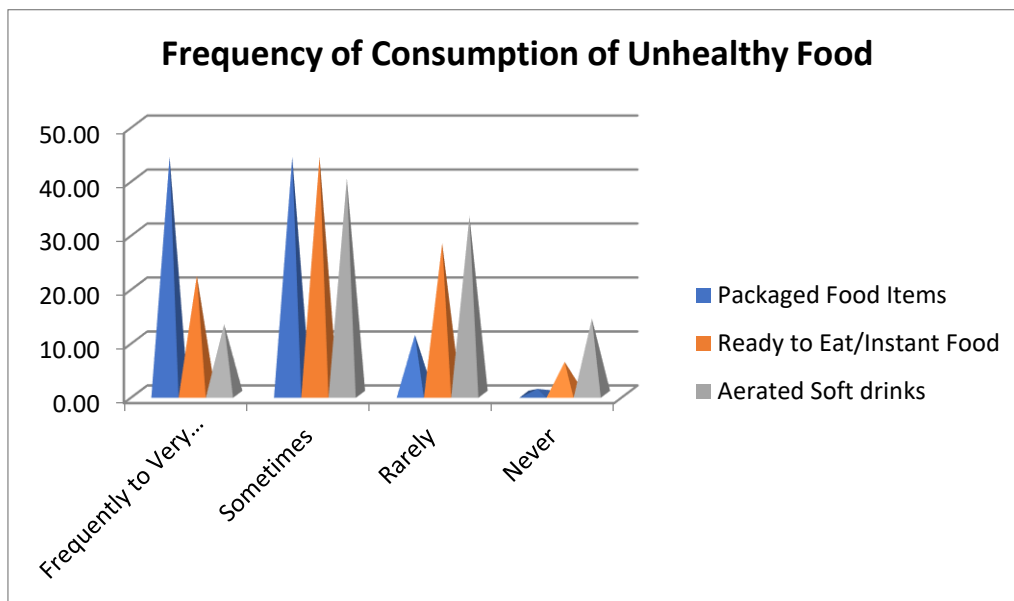

Figure1: Frequency of consuming different food types

A comparison of these three categories of unhealthy food shows that it is the packaged food that is consumed most commonly by the people. As more than 40% of the respondents admitted that they consume packaged foods frequently to very frequently. An almost same per cent of respondents said that they consume these packaged food items sometimes. It was less than 20% of the respondents said that their consumption of these is either rarely or never.

Figure 2: Consumption of different categories of food

A comparison of these three categories of food shows that it is the packaged food that is consumed most commonly by the people. As more than 40% of the respondents admitted that they consume packaged foods frequently to very frequently. An almost same per cent of respondents said that they consume these packaged food items sometimes. It was less than 20% of the respondents said that their consumption of these is either rarely or never.
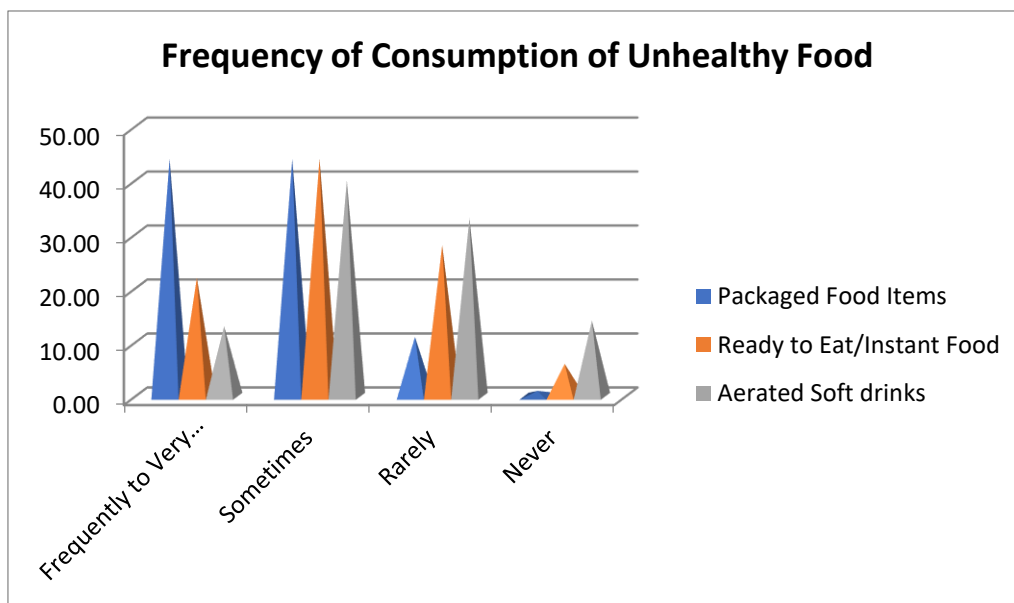
In contrast to this majority of respondents, as much as more than 65% stated that they consume the instant foods sometimes to rarely. Likewise, for aerated drinks too almost 70% of the respondents shared that

they consume aerated drinks rather less frequently (ranging from sometimes to rarely). This higher percentage of people choosing instant foods or aerated drinks either sometimes or rarely clearly indicates that they are making healthier choices by applying restraints towards these food items.

Choices of food that is between healthy and unhealthy brings with it a lot of doubts and temptations. For this people refer to various sources. The most commonly used source today is internet and social media that has a whole lot of information base. Almost as many as 73 per cent of the respondents depend on this source. The other sources that are used by the respondents for gaining information regarding food include consulting a dietician or doctor, magazines and newspaper and TV and radio. This explicitly indicates that though people like to have some kind of reference regarding the food items. For this majority refer to sources like internet and social media that is rather not a reliable source of information that might or might not be true always as there is no check on the same. (Refer table 4)

TABLE 3 Sources of Information

Sources of reference for food	Respondents (%)
Consult a Dietician/Doctor	11.56
Magazines/Newspaper	9.25
Tv/Radio with Magazines, Newspaper	2.89
Internet and Social -Media	72.25
others	4.05
Total	100
Source: primary data	

Exploratory Factor Analysis (EFA)

After organising the data and cleaning for duplicate and incomplete (unengaged) responses, sample of 173 was analysed. First of all, data adequacy and sphericity were tested using were tested using Bartlett's test of sphericity and Kaise Meyer Olkin (KMO) test respectively. These are the basic requisites for performing data reduction analysis using Principal component analysis. A KMO value of 0.786 and a p value of 0.000 results showed that the sample was adequate to perform the analysis. (Refer table 3)

TABLE 4 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.786
Bartlett's Test of Sphericity	Approx. Chi-Square	625.334
	df	28
	Sig.	0

The two important latent variables (factors) under study were AWARE and BEHAVE. The former represented the behaviour of consumers towards consuming 'unhealthy or junk' food (including eating out) as described earlier. The factor AWARE measured the awareness of respondents about food and its relation to human health. This awareness was more about common knowledge and perception of healthy and unhealthy food and did not seek too technical knowledge about food. The factor AWARE has five statements and the factor BEHAVE had three statements, each with loading greater than 0.6 (REFER table 5). Further the two factors had an explained variance of close to 67%, and the first factor giving 42 % explained variance, thereby ruling out common factor bias. The Cronbach's Alpha value for each was greater than 0.7, confirming the scale reliability.

TABLE 5 Factor Components and Reliability

Factor	Variable	Statement	Loading	Cronbach's Alpha
AWARE	s1	Food Affects our health	0.761	
	s2	Consumption of junk food is bad for health	0.752	
	s3	You are careful about what food you eat	0.829	
	S4	You are careful about what food you eat	0.873	0.886
	S5	You always check ingredients while selecting food items	0.769	
BEHAV	B1	How often do you consume packaged items	0.673	
	B3	How often do you consume ready to eat/ instant food	0.672	0.747
	B2	How often do you consume aerated drinks	0.806	
source: primary data analysis				

TABLE 6 Descriptive Statistics and Correlation Coefficient

Variable	Mean	Std. Dev	Std. error of Mean	Pearson Correlation	Sig. (2-tailed)
AWARE	3.96	0.938	0.071	-.234**	0.002**
BEHAV	2.96	0.763	0.058	(N=173)	
** significant at 5% level of significance					

The mean of the variable AWARE was found to 3.96, while that of BEHAV was 2.96. A clear indication that awareness is higher in the sample population. The standard deviation, however is also higher in AWARE then of BEHAV. A correlation between the two factors was found to be negative but low and statistically significant. This implies that as the awareness about food increases, the behaviour to eat unhealthily has decreases. This is intuitively expected in any society and the present findings do verify this. But the correlation coefficient was seen to be only - 0.234. A low value indicates a gap between awareness and behaviour. (Refer table 5). High awareness is not leading to high (unfavourable) behaviour towards unhealthy eating.

To study the impact of demographic variables on the awareness and behaviour to unhealthy food, the null hypotheses were tested by applying ANOVA. (TABLE 7).

The mean perception score of awareness and behaviour were not significantly different across, gender and educational qualification. However, both had a significant difference across age groups. The null hypotheses pertaining to age were rejected but for others these failed to be rejected. (Table 8)

TABLE 7 ANOVA: NULL HYPOTHESES OUTPUT

Null Hypotheses	Sig (p value)	Rejected (Y/N)
The mean of AWARE is not different across gender	0.877	N
The mean of AWARE is not different for income groups	0.687	N
The mean of AWARE is not different for educational qualification	0.62	N
The mean of AWARE is not different across age groups	0.045**	Y
The mean of BEHAV is not different across gender	0.258	N
The mean of BEHAV is not different for income groups	0.468	N
The mean of BEHAVE is not different for educational quaification	0.195	N
The mean of BEHAVE is not different across age groups	0.047**	Y

TABLE 8 Relationship of Latent Variables with Age

Age goup	AWARE		BEHAV	
	Mean	Std Dev.	Mean	Std Dev.
18-25	4.0562	0.79069	3.0000	0.8
26-30	3.4395	1.263	2.8519	0.603
31-35	4.1111	0.988	2.9444	0.772
35-50	3.4119	1.41461	2.7333	0.56625
More than 50	3.9491	0.90615	3.0667	0.78367
Sig	0.045**		0.047**	

The 18- to 25-year-old category has a certain degree of freedom from parental control but has limited spending power. While this makes them likely to patronise the relatively cheaper fast-food joints, they are also likely to be most conscious of their weight and body shape. The latter could make them careful about what they eat, although information about 'healthy' food may be sourced from friends and the internet. Those aged between 25 and 35 would be financially independent and many would be ready to explore new cuisines. Their food choices are likely to be influenced by their professional lives. People aged above 40 are more likely to be concerned about the impact of diet on their health and would eat more of what they perceive as healthy food. Overall, busier lifestyles have made dining out or ordering in a popular option. The ease of having food delivered at home has increased due to the availability of app-based service providers like Swiggy and Zomato. The availability of cuisines from around the world and the desire to experience them has also encouraged this trend.

TABLE 9 ANOVA-Impact of Income on Latent Variables

Monthly Household Income	AWARE		BEHAV	
	Mean	Std Dev.		
Up to 25000	4.052	0.782	2.951	0.690
25,000 to 50,000	3.933	1.500	2.417	3.933
25000 - 50000	4.001	0.844	2.971	0.850
50000-1lakh	3.788	1.069	3.000	0.781
More than 1 lakh	4.068	0.846	3.062	0.760
Significance	0.687		0.468	

TABLE 10 Mean Differences Across Educational Qualification

Education Level	AWARE		BEHAVE
Class XII	Mean	4.31	2.78
	Std. Dev	0.62	0.78
Graduate	Mean	3.80	3.13
	Std. Dev	0.97	0.77
Post Grad	Mean	3.75	2.89
	Std. Dev	1.19	0.70
Higher to Post grad	Mean	4.29	2.83
	Std. Dev	0.63	1.65
Professional Degree	Mean	4.16	3.12
	Std. Dev	0.59	0.61

There was a statistically significant difference in means of awareness and behaviour across age groups. The level of education did not seem to have much influence on the awareness of consumers with respect to food though the mean was seen to be higher with education but was not statistically significant (Table 10)

V. Conclusion

It can thus be said that factors other than awareness influence the behaviour of consumers towards unhealthy eating. 'Awareness' therefore does not seem to be sufficient influence on the behaviour of young population sampled in this study. The other factors like convenience, advertisements seem to be more effective in pulling the consumers away from healthy or home cooked food. The food choices made by the people are often verified by the people and that awareness for dietary choices is also visible in their beliefs. As majority of the respondents as high as more than 93% clearly believed and opined that food affects health and also that consumption of junk food is bad for health. Likewise, more than 83% of the respondents stated that they are careful about the food they eat and also they are well aware of the nutritional and health value of food consumed by them. In spite of being conscious about the dietary choices being made by them, 32% of the respondents said that they don't check the ingredients while selecting food items. Also, a 65% of the respondents said they can be persuaded by the advertising regarding buying and consuming a food.

This study was an exploration into the beliefs, awareness and behaviour of young consumers in the age bracket of 18-35. The survey and its analysis gave some important insights. One of the most important being that awareness has not led to 'unhealthy avoidance behaviour'. So policy makers or sociologists wishing to promote heathy eating can depend on the power of advertising and social impact through celebrities and effective communication.

This study is a cross sectional study that gives a direction to future research. A longitudinal study measuring the regression of advertisements and awareness on behaviour is the future research prospect provided by this study. This study gives a direction to the policy makers aiming to inculcate safe and nutritious food habits to meet their dietary needs and food preferences for a healthy and active life as per the UN SDG.

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