Impact of COVID – 19 on Frequency of Food Purchase in Families of Andhra Pradesh

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Authors' contributions

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

Original Research Article

ABSTRACT

The study was undertaken to determine the impact of COVID-19 on the frequency of food purchases in families in Andhra Pradesh. An ex post facto research design was adopted for the study. The study comprised a 360-person sample of families covering both urban and rural areas of three districts of Andhra Pradesh in all three time periods (before, during, and after the pandemic). The frequency of food purchases was used to assess whether there was any change in purchasing patterns in all three time periods among families. The frequency of purchasing food groups was also studied. The results showed that purchasing frequency varied among the families. Comparison of purchasing pattern between the three time periods showed that there was a statistically significant difference in the purchasing pattern of millets. Non-significantly correlated food groups were pulses, fresh fruits, green leafy vegetables, vegetables, milk and milk products, chicken, meat, eggs, fish, sugars, dry fruits, sweets and savories and coffee powder, during three time periods. During the

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pandemic period, an increase in frequency of purchase was seen in millets and pulses was seen while there was no change in purchasing pattern of cereals and nuts. A decrease in consumption of chicken and sugars was observed. In the post-pandemic period, an increase in frequency of purchase in meat and eggs was noted, and a decrease was noted in purchase of millets and fruits.

1. INTRODUCTION

Food habits and choices in India are changing due to food markets, urbanization, growth in food prices, uncertainty in food production and unequal distribution over the past decade. This leads to either food insecurity or obesity in people. About 35% of the Indian population is underweight, while the overweight/obesity rate is estimated at about 13% for women and 10% for men. Food shopping is directly associated with income in both urban and rural areas. Householders reduced their food shopping by 0.8% for every 1% increase in food prices. Changes in household shopping are shifting from food to other items in both urban and rural areas.

In India, women are more involved in decisions related to food shopping, even though their involvement in decision-making is low in financial management. Women are considered to be part of their family's prestige. More than 70% of women make individual decisions about the 'items to be cooked' in their homes. A woman is generally perceived as the 'queen of the kitchen' in taking decisions about the items to be cooked for their husbands or other family members. In addition to this, whether in nuclear or joint families, women eat food only after the males and children in the family complete their eating. This attitude is more prevalent under conditions of poverty and limited access to resources.

The COVID-19 pandemic, caused by a novel coronavirus, was a threat to humans [1]. Food purchasing during the lockdown period was set by strict rules for people's movements to restrain the spread of COVID-19. Lack of awareness about nutrition influenced food environments [2]. Consumers suffered from a severe crisis that had affected their lives in all social, economic and psychological aspects [3]. Since the pandemic's long-term crisis has resulted in alterations, it has had a direct impact on human society [4].

Consumer behavior was positively shaped by the COVID-19 crisis by making the consumers to pay more attention to prices, made them prefer more eco-friendly and socially responsible companies [5], shopping habits, and food waste management [6,7]. Shopping habits changed substantially, or new ones were introduced, such as online shopping, home deliveries, and cashless payments [8]. Some changes were brought in daily life by the pandemic, that included reduced frequency of shopping, focusing mainly on essential goods [9], changes in eating habits and spending pattern on food [10,11].

Thus, food shopping has changed during the pandemic's evolutionary phases. The restrictions imposed by the regulations led to protect public health and the lockdown prescribed by law made the rush to purchase large quantities of foodstuffs such as pasta, UHT milk, rice, extra virgin olive oil and biscuits. From a 'convulsive' consumer buying attitude, there was a shift to a 'reflexive' buying attitude [12,13].

An interesting question for researchers was whether the phenomenon of consumption that was followed during COVID 19 Pandemic can be considered lasting and to what extent it would influence food purchasing behavior in the future andguide the activities of public and private stakeholders, including production companies. The problem of managing the consequences of the pandemic, especially the vulnerability of populations in terms of health and nutrition has prompted the world's leading institutions dealing with these issues (FAO, OIE, UNEP and WHO) to set up a multidisciplinary group of experts to strengthen cross-sectoral collaboration called 'One Health'. The aim was to create an integrative and systemic approach to health based on the understanding that human health is closely linked to the healthiness of food, animals and the environment and the healthy balance of their impact on ecosystems [14].

The Theory of Planned Behavior (TPB), which is based on the idea that an individual's behavior and attitude are linked and has been the basis for countless studies in the fields of social psychology and consumer behavior, can help us understand the phenomenon of food purchasing during pandemic. A close link between beliefs,

attitude, intentions, and behavior has thus been affirmed using models capable of correctly capturing and measuring specific variables through which the links between attitude and action in food purchasing can be investigated (Giampietri *et. al*. 2018; Wang and Scrimgeour, 2021).

Specifically, in TPB, behavior is defined by intention, the latter in turn being influenced by three key factors which are attitude, influence of people around them and behavioural control.

2. METHODOLOGY

An ex post facto research design was adopted for the study**.** It is defined asan experiment in which a researcher, instead of finding a treatment, examines the effect of a naturally occurring treatment after it has occurred. In other words, it is a study that attempts to discover the pre-existing causal conditions between groups. One is the cause, and the other is the effect.

A stratified sampling technique was used to select the sample from both rural and urban areas. The families were selected in such a manner that 30 from each village were selected. Thus, the total sample selected consisted of 180 families from urban and 180 from rural areas. Three districts selected for this study were Krishna, Vishakhapatnam and Chittoor districts of Andhra Pradesh. In the 1231 family members, there were 406 males and 825 females. Among them, 31 males and 59 females were adolescents and the rest of them were adults. These three districts were selected because, among these three districts, two were pilgrim centres and the other was a tourist centre. Vijayawada was located in the south-eastern part of Andhra Pradesh, Tirupati was located in the southern part of Andhra Pradesh and Vishakhapatnam was located in the north-eastern part of Andhra Pradesh.

The consent of the families was obtained for participation in the study by explaining the aim of the study. The research study was presented to the Institutional Human Ethics Committee (IHEC) of the university before being taken up at the field level and approval was obtained.

2.2 Nature of the Data

Quantitative data was used in this study.

2.3 Tools for Data Collection

The food purchasing pattern was measured using the food purchasing questionnaire, which is a self-structured questionnaire developed by individuals for research purposes. The food purchasing questionnaire consisted of 21 food groups, namely cereals, millets, pulses, fresh fruits, green leafy vegetables, other vegetables, milk and milk products, chicken, meat, eggs, fish and other sea food, oils, sugars, nuts, spices, dry fruits, ready-to-eat foods, baked products, sweets and savory foods, beverages, coffee and tea. In each table, the time period of the purchase was mentioned. Each food group's frequency of purchase is compared from the pre-pandemic situation to the present situation. The codes represented for time period of purchase were as follows: daily -1, weekly -2, monthly -3, yearly -4, whenever required -5.

2.4 Statistical Analysis

Percentages and correlation were used to calculate the frequency of food purchases by selected families in all three time periods in three districts of Andhra Pradesh. These statistical tools were used to see the significant differences in food purchasing patterns of selected families in all three time periods in three districts of Andhra Pradesh.

3. RESULTS AND DISCUSSION

The distribution of respondents according to the head of the family is represented in Table 1. The data revealed that most of the respondents were professionals (23 per cent), followed by elementary occupations (19 per cent), technicians and associate professionals (18 per cent), skilled workers and shop and market sales workers (14 per cent), clerks (11 per cent), plant and machine operators and assemblers (9 per cent), skilled agricultural and fishery workers (3 per cent), craft and related trade workers (2 per cent), legislators, senior officials, and managers (1 per cent), and none were unemployed (0 per cent). The above scale was derived from Kuppuswamy (2019).

The distribution of respondents according to the education of the head of the family is represented in Table 2. Out of 360 respondents, the majority of respondents were graduates (37 per cent), followed by intermediate or diploma holders (18 per cent), high school certificate holders (14 per cent), illiterate (9 per cent), profession or honours, middle school certificate holders (8 per cent) and primary school certificate holders (6 per cent). The above scale was derived from Kuppuswamy (2019).

Table 1. Distribution of respondents according to head of the family

S.No	Occupation of the Head	Frequency	Percentage (%)
1	Legislators, Senior Officials & Managers	6	1
2	Professionals	81	23
3	Technicians and Associate Professionals	66	18
4	Clerks	38	11
5	Skilled Workers and Shop & Market Sales Workers	52	14
6	Skilled Agricultural & Fishery Workers	9	3
7	Craft & Related Trade Workers	6	2
8	Plant & Machine Operators and Assemblers	32	9
9	Elementary Occupation	70	19
10	Unemployed	0	0
Total		360	100

Table 2. Distribution of respondents according to education of the Head of the family

S.No	Education of the Head	Frequency	Percentage (%)
1	Profession or Honours	29	8
2	Graduate	133	37
3	Intermediate or diploma	64	18
4	High school certificate	51	14
5	Middle school certificate	27	8
6	Primary school certificate	22	6
7	Illiterate	34	9
Total		360	100

Table 3. Distribution of respondents according to monthly family income in Rupees

S.No	Monthly Income of the Head	Frequency	Percentage (%)
1	Rs ≥123,322	28	8
2	Rs 61,663-123,321	30	8
3	Rs 46129-61,662	47	14
4	Rs 30,831-46,128	60	16
5	Rs 18,497-30,830	96	26
6	Rs 6,175-18,496	83	24
7	Rs ≤ 6174	16	4
Total		360	100

Table 4. Distribution of families based on food purchasing pattern of the families before, during pandemic and in present situation

S.No	Foods	Time period	Frequency of Purchase				
			Daily (%)	Weekly (%)	Monthly (%)	Yearly (%)	Whenever Required (%)
1	Cereals	Before pandemic	0	2 (0.55)	358 (99.44)	0	0
		During pandemic	0	2 (0.55)	358 (99.44)	0	0
		Present	0	2 (0.55)	358 (99.44)	0	0
2	Millets	Before pandemic	0	0	227 (63.05)	1 (0.27)	1 (0.27)
		During pandemic	0	0	245 (68.05)	1 (0.27)	2 (0.55)

S.No	Foods	Time period	Frequency of Purchase				
			Daily (%)	Weekly (%)	Monthly (%)	Yearly (%)	Whenever Required (%)
		Present	0	0	230 (63.8)	1 (0.27)	2 (0.55)
3	Pulses	Before pandemic	0	1 (0.27)	356 (98.88)	3 (0.83)	0
		During pandemic	0	1 (0.27)	357 (99.16)	2 (0.55)	0
		Present	0	1 (0.27)	357 (99.16)	2 (0.55)	0
4	Fruits	Before pandemic	1 (0.27)	274 (76.11)	56 (15.55)	0	4 (1.11)
		During pandemic	1 (0.27)	274 (76.11)	56 (15.55)	0	4 (1.11)
		Present	1 (0.27)	273 (75.83)	57 (15.83)	0	4 (1.11)
5	Green leafy vegetables	Before pandemic	4 (1.11)	304 (84.44)	18 (5)	0	0
		During pandemic	4 (1.11)	306 (85)	17 (4.72)	0	0
		Present	4 (1.11)	306 (85)	17 (4.72)	0	0
6	Other vegetables	Before pandemic	9 (2.5)	314 (87.22)	37 (10.27)	0	0
		During pandemic	5 (1.38)	318 (88.33)	37 (10.27)	0	0
		Present	9 (2.5)	313 (86.94)	38 (10.55)	0	0
7	Milk and milk products	Before pandemic	347 (96.38)	2 (0.55)	3 (0.83)	0	0
		During pandemic	346 (96.11)	2 (0.55)	3 (0.83)	0	0
		Present	344 (95.55)	2 (0.55)	3 (0.83)	0	0
8	Chicken	Before pandemic	0	269 (74.72)	23 (6.38)	0	0
		During pandemic	0	262 (72.77)	29 (8.05)	0	0
		Present	0	264 (73.33)	29 (8.05)	0	0
9	Meat	Before pandemic	0	26 (7.22)	178 (49.44)	0	4 (1.11)
		During pandemic	0	28 (7.77)	176 (48.88)	0	4 (1.11)
		Present	0	28 (7.77)	178 (49.44)	0	3 (0.83)
10	Egg	Before pandemic	2 (0.55)	49 (13.6)	265 (73.6)	0	4 (1.11)
		During pandemic	1 (0.27)	50 (13.8)	266 (73.8)	0	3 (0.83)
		Present	1 (0.27)	49 (13.61)	268 (74.44)	0	3 (0.83)
11	Fish and	Before	0	28	226	0	2

S.No	Foods	Time period	Frequency of Purchase				
			Daily (%)	Weekly (%)	Monthly (%)	Yearly (%)	Whenever Required (%)
	other sea foods	pandemic		(7.77)	(62.77)		(0.55)
		During pandemic	0	28 (7.77)	228 (63.33)	0	2 (0.55)
		Present	0	28 (7.77)	228 (63.33)	0	2 (0.55)
12	Oils	Before pandemic	0	4 (1.11)	354 (98.33)	1 (0.27)	1 (0.27)
		During pandemic	0	3 (0.83)	355 (98.61)	1 (0.27)	1 (0.27)
		Present	0	3 (0.83)	356 (98.88)	1 (0.27)	0
13	Sugars	Before pandemic	0	6 (1.66)	348 (96.66)	0	1 (0.27)
		During pandemic	0	6 (1.66)	347 (96.38)	1 (0.27)	0
		Present	0	5 (1.38)	345 (95.83)	1 (0.27)	0
14	Nuts	Before pandemic	0	0	344 (95.55)	0	0
		During pandemic	0	0	344 (95.55)	0	0
		Present	0	0	344 (95.55)	0	0
15	Spices	Before pandemic	0	0	347 (96.38)	12 (3.33)	1 (0.27)
		During pandemic	0	0	347 (96.38)	12 (3.33)	1 (0.27)
		Present	0	0	347 (96.38)	12 (3.33)	1 (0.27)
16	Dry fruits	Before pandemic	0	0	238 (66.11)	0	0
		During pandemic	0	0	247 (68.61)	0	0
		Present	0	0	242 (67.22)	0	0
17	Ready to eat foods	Before pandemic	1 (0.27)	31 (8.61)	121 (33.61)	0	6 (1.66)
		During pandemic	1 (0.27)	30 (8.33)	121 (33.61)	0	6 (1.66)
		Present	1 (0.27)	31 (8.61)	122 (33.88)	0	6 (1.66)
18	Baked products	Before pandemic	4 (1.11)	32 (8.88)	229 (63.61)	0	12 (3.33)
		During pandemic	4 (1.11)	32 (8.88)	229 (63.61)	0	12 (3.33)
		Present	4 (1.11)	33 (9.16)	229 (63.61)	0	12 (3.33)
19	Sweets and Savouries	Before pandemic	0	7 (1.94)	235 (65.27)	0	11 (3.05)
		During pandemic	0	8 (2.22)	232 (64.44)	0	11 (3.05)
		Present	0	7 (1.94)	233 (64.72)	0	11 (3.05)

S.No	Foods	Time period	Frequency of Purchase				
			Daily (%)	Weekly (%)	Monthly (%)	Yearly (%)	Whenever Required (%)
20	Beverages	Before pandemic	1 (0.27)	20 (5.55)	182 (50.55)	0	7 (1.94)
		During pandemic	1 (0.27)	19 (5.27)	181 (50.27)	0	7 (1.94)
		Present	1 (0.27)	18 (5)	182 (50.55)	0	7 (1.94)
21	Coffee	Before pandemic	0	2 (0.55)	272 (75.55)	0	1 (0.27)
		During pandemic	0	2 (0.55)	271 (75.27)	0	1 (0.27)
		Present	0	2 (0.55)	268 (74.44)	0	1 (0.27)
22	Tea	Before pandemic	0	0	291 (80.83)	0	1 (0.27)
		During pandemic	0	0	290 (80.55)	0	1 (0.27)
		Present	0	0	288 (80)	0	1 (0.27)

Table 3 shows the distribution of families according to monthly family income in rupees per month. Out of 360 respondents, 26 per cent earned an income of Rs 18,497–30,830 per month, 24 per cent earned between Rs 6,175–18,496 per month, 16 per cent earned between Rs 30,831-46,128 per month, 14 per cent earned between Rs 46129–61,662 per month, 8 per cent earned Rs ≥123,322 per month and Rs 61,663–123,321 per month and 4 per cent earned Rs ≤ 6174 per month. This scale was derived from Kuppuswamy (2019).

Respondents were individually distributed according to their frequency of purchase of foods in their families under the heads daily, weekly, monthly, yearly and whenever required. The corresponding data is presented in Table 4.

Out of 360 respondents the data obtained for food purchasing pattern of families showed that milk and milk products were bought on daily basis by majority of families. Fresh fruits, green leafy vegetables, vegetables, eggs, ready to eat foods, baked foods and beverages were purchased by few families (0.27 to 2.5 per cent) on a daily basis. In a study by Litton et al. [15] it was expressed that there existed around 36.2 % of food insecure respondents who reduced their purchase of fresh fruit and vegetables; reasons included poor quality, poor availability, high price, reduced store trips, and concerns of contamination when compared to the previous month. The respondents of the present study also would have reduced their purchase of fresh fruits, green leafy vegetables and eggs for the same reasons. However the percentage of respondents who can be classified as food insecure respondents are very few (only 2.5%) in the present study.

Foods that were purchased on weekly basis by majority of families included fruits (75 to 76 per cent), green leafy vegetables (84 to 85 per cent), other vegetables (86 to 88 per cent) and chicken (72 to 74 per cent). Other food groups like cereals, pulses, milk, meat, eggs, fish, oils, sugars, ready to eat foods, baked products, sweets and savouries, beverages and coffee powder were bought on weekly basis by few families (0.27 to 13 per cent).

Foods that were purchased on monthly basis by majority of families included cereals (99 per cent), millets (63 to 68 per cent), pulses (98 to 99 per cent), meat (48 to 49 per cent), eggs (73 to 74 per cent), fish (62 to 63 per cent), oils (98 per cent), sugars(95 to 96 per cent), nuts (95 per cent), spices (96 per cent), dry fruits(66 to 68 per cent), ready to eat foods (33 per cent), baked foods (63 per cent), sweets and savories (64 to 65 per cent), beverages (50 per cent), coffee powder (74 to 75 per cent) and tea powder (80 per cent). Other food groups like fresh fruits, green leafy vegetables, vegetables, milk, chicken were bought on monthly basis by few families (0.83 to 15 per cent).

Table 5. Correlation between frequency of purchasing pattern during the three time periods

S.No	Time period	Type of statistical test	Correlations		
			Before	**During**	**Present**
1	Before	Pearson Correlation	1	**. 998****	**1.000****
2	During	Pearson Correlation	**.998 ****	1	**.999****
3	Present	Pearson Correlation	1.000**	.999**	1

** Correlation was significant at the 0.01 level

Foods that were purchased on yearly basis by few families included millets, pulses, oils, sugars and spices (0.27 to 3 per cent). Bairagi et. al. [16] indicated that price of basic food items such as atta (wheat flour) and rice increased significantly during the pandemic compared to the pre-pandemic period. In contrast, during the same period, the price of onions declined significantly. This was due to panic buying, hoarding, and storability of food items. Also income and cash transfers from the government negatively affected commodity prices. In present study also respondents (0.27 to 3 per cent) faced similar emotions as explained in the above study during pandemic period when compared to before pandemic period.

Foods that were purchased whenever required by few families included millets, fruits, meat, eggs, fish, oils, sugars, spices, ready to eat foods, baked products, sweets and savouries, beverages, coffee powder and tea powder (0.27 per cent to 3 per cent).

The data on statistical correlation of the purchasing pattern during the three time periods is presented in Table 5.

Statistical analysis of the data on food purchasing during the three time periods showed that there is a statistically significant difference in the purchasing pattern of millets. A non-significant difference was observed in food groups like pulses, fresh fruits, green leafy vegetables, vegetables, milk and milk products, chicken, meat, eggs, fish, sugars, dry fruits, sweets and savories, coffee powder during the three time periods. A study by Lu et al. [17] explained that purchase frequency of all food groups grew 71.2% during the COVID-19 crisis. City type and online shopping frequency of respondents are positively correlated with purchase frequency in normal and COVID-19 crisis periods. In present study respondents purchasing frequency was seen more in case of millets. The reasons stated were that they were available at low cost and due to health consciousness.

Another study by Nielsen et al. [18] reported that at three time periods of the pandemic, frequency of in-store grocery shopping was lowest during the lockdown (once per week or less), and significantly increased over time to resemble pre-pandemic frequency. In present study in store grocery shopping was chosen by families when compared to online shopping due to their family status, personal likes and beliefs. The reasons stated were due to lockdown, timings restrictions were held by government so many families purchased by following shop timings and government rules and also by keeping in view their families economic status. Before pandemic and in post pandemic situation families choose to go to more shopping whenever they required groceries in free timings. Because they believed that quality of food products were not appealing in online deliveries when compared to shops selling food products offline.

4. CONCLUSION

In conclusion, it can be stated that based on people's affordability status, their needs, convenience and due to restricted timing in the pandemic period, the frequency of food purchases varied from a daily, weekly or monthly basis to purchasing whenever required. During the pandemic period an increase in the frequency of purchases was seen in millets. A slight increase was seen in pulses, green leafy vegetables, other vegetables, eggs, fish, oils and dry fruits. No change in purchase was noted for cereals, fruits, milk, nuts, spices, baked and ready to eat foods. A slight decrease in purchases was noted for chicken, meat, sugars, beverages, sweets, coffee and tea powder during the pandemic. In the post-pandemic period a slight increase in frequency of purchase was noted in other vegetables, chicken, meat, eggs, oils, ready-to-eat foods, sweets and beverages. In the post-pandemic period a slight decrease in frequency of

purchase was noted in millets, fruits, milk and milk products, sugars, dry fruits, coffee and tea.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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