



Impact of COVID-19 on consumption of food and health supplements among various age groups in Tamil Nadu: A cross sectional study

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Abstract

A cross sectional study using a self-administered questionnaire was designed to assess the changes in the general food habits, dietary intake and healthy food preparations to improve immunity. The study was conducted through an online platform, from 16th of June to 26th of June, 2020. Total of 707 participants completed the questionnaire. It includes 243 (34%) males and 464 (66%) females between the age group of 18-80 years. The collected data were analyzed by using Microsoft excel software. Increase in the quality and quantity of healthy food intake was seen in 353 participants and maximum response (57.1%) were obtained from 26-40 age group. 376 participants consume health supplements and 53.8% response was seen in 18-25 age group. This study shows more self-awareness and acceptance of changes towards healthy food consumption and intake of health supplements as a preventive measure among all the age groups.

Keywords: COVID-19, food intake, health supplements, physical activity

1. Introduction

COVID-19 a disease, caused by SARS-CoV-2 was identified in Wuhan, the capital city of Hubei Province in China and exponentially spreading globally ^[1] and it was declared as a pandemic by the WHO on 11 March 2020 ^[2]. A nation wise lockdown in some form has been implemented to combat the spread of the disease. This pandemic situation has claimed more lives and there is an immediate need to take precautions, and to focus on building one's immunity as well as overall health.

Covid-19 has changed the individual's lifestyle and indirectly affected our physical and mental health. As people are locked up in their homes, they began to look for health-enhancing ingredients to manage their diet and physical activity in a more healthy and proactive way to maximize their well-being ^[3].

More than 2,500 years ago, Hippocrates said, "Let food be thy medicine and medicine be thy food." In this pandemic situation people started consuming healthy diets to protect themselves from the deadly virus. As per the recommendations of WHO, nutrition and physical activity are the factors essential for staying healthy during self-quarantine ^[4]. Food and agriculture organization of the United Nations has recommended a healthy diet during the COVID-19 pandemic which includes intake of plenty of fruits, vegetables, nuts, grains and also suggests to maintain good hydration and hygienic food preparation ^[5].

There is a drive among people to consume food with nutritional value to combat COVID-19. Evidences shows that diet has an extensive role on the immune system and

susceptibility to diseases. Specific nutrients and its combinations have effects on the immune system and gene expression. So it is mandatory to maintain a balanced nutritional diet for the effective functioning of the immune system ^[6, 7].

The main aim of this study was to investigate whether there has been a change in the consumption of quality and quantity of food and health/immune supplements of adults between the ages of 18 and 80 during this pandemic situation. This study includes individuals who follow social isolation as a preventive measure.

2. Methodology

A cross-sectional study was carried out among population in Tamil Nadu who were encouraged to participate in the present study. Participation in the online questionnaire was entirely voluntary. The survey was conducted through Google form by using an online platform, from 16th of June to 26th of June, 2020.

This self-administered questionnaire was designed to assess the changes in their general food habits, dietary intake and questions focused on healthy food preparation, and physical activity during this pandemic period. The participants were explained about the objective of the study and online consent was obtained.

The questionnaire was divided into four main sections. The first section (Q1-Q7) consists of General information which includes age, gender, qualification, occupation, place of residence and their diet pattern. The second section questions (Q8-Q14) was related to the changes in cooking

pattern, quality and quantity of the food consumption. Third section has questions (Q15-Q17) which are related to physical activity and changes in body weight. Fourth section includes questions (Q17-Q23) which are based on the intake of health supplements/immune boosters during this pandemic situation.

3. Results

The collected data were analyzed by using Microsoft excel software. Validation of Questionnaire was done with 40 participants. After validation, questionnaire was posted online. Total of 707 participants completed the questionnaire and which includes 243(34%) males and 464(66%) females.

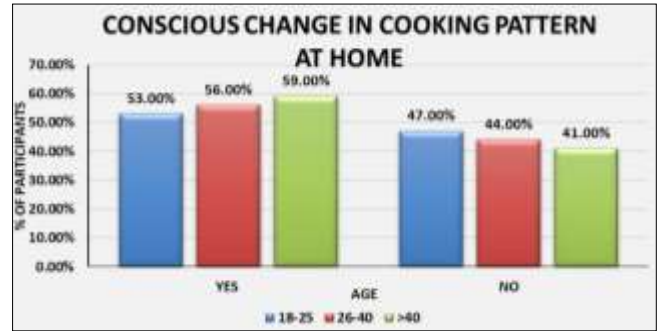


Fig 3: Conscious changes in cooking methods among the participants (n=707)



Fig a: Location of the Participants

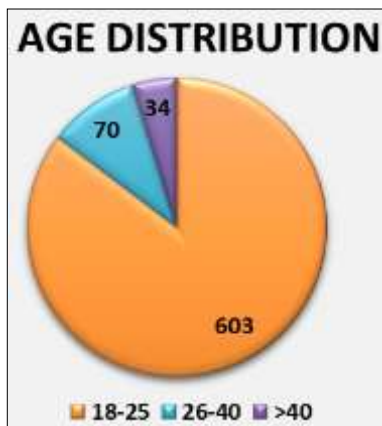


Fig 1: Age distribution among participants (n=707)

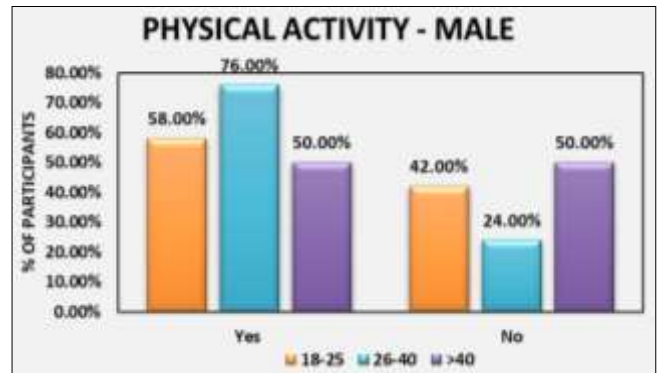


Fig 4: Physical activity among Male participants (n=243)

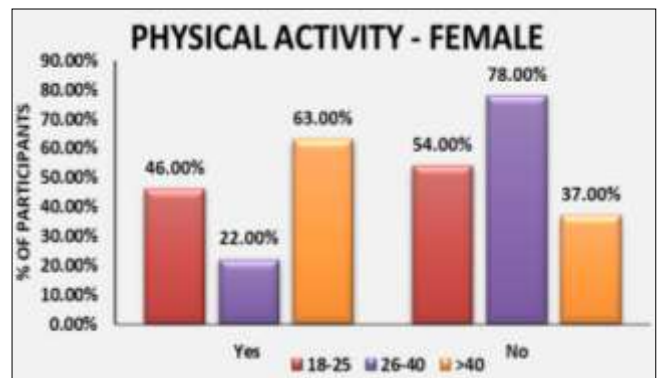


Fig 5: Physical activity among Female participants (n=464)



Fig 2: Dietary habits among participants (n=707)

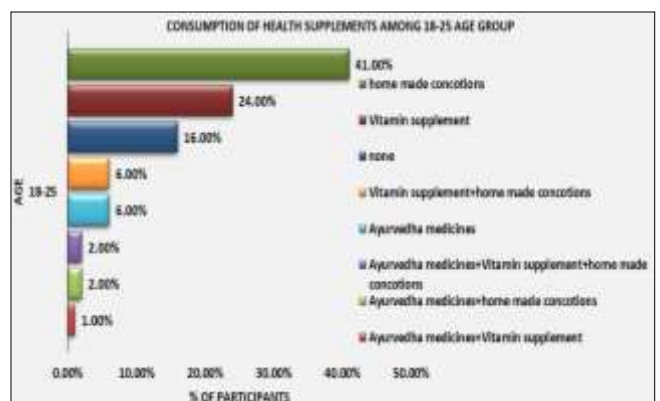


Fig 6: Consumption of health supplements among the age Group 18-25 (n=603)

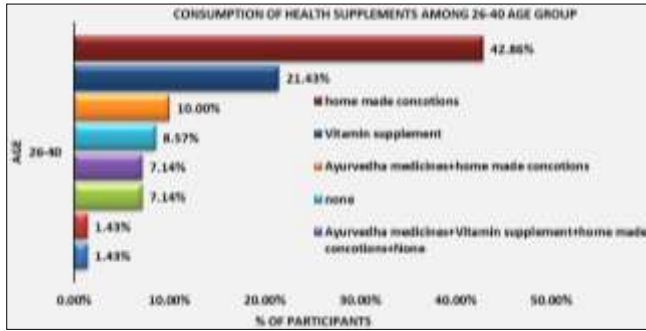


Fig 6: (a)-Consumption of health supplements among the age Group of 26-40 (n=70)



Fig 6: (b)-Consumption of health supplements among the age group >40 (n=34)

Age distribution of our study population (n=707) were as follows.603(85.2%) respondents belongs to the age group of 18-25years, 70 (9.9%) respondents between the age group of 25–40 years and 34(4.8%) respondents were more than 40 years of age.

Table 1: Shows the response of participants with different age groups for the changes in the food intake during COVID-19 pandemic situation (total n=707)

Q. No	Questions	Responses (n=704)		
		18-25 (n=603)	26-40 (n=70)	>40(n=34)
1	Do you think this COVID-19 outbreak has altered your food intake? (increase or decrease in portion size or frequency)			
	Yes increased	176	19	8
	Yes decreased	133	13	10
	No change	294	8	16
2	Is there any conscious change in cooking in your home during? COVID-19 outbreak period?			
	Yes	318	39	20
	No	285	31	14
3	From whom do you receive healthy cooking tips?			
	Family	259	17	6
	Friends	10	2	6
	None	72	13	4
	Internet	92	18	8
	Doctor	44	2	0
	Family & Friends + Internet	20	7	5
	Friends+ Internet	4	2	3
	Doctor + Family	23	1	0
	Doctor+ Family & Friends + Internet	20	0	1
	Doctor+ Internet	3	2	0
	Family + Friends	13	1	1
	Family + Internet	33	5	0
	Doctor+ Family & Friends	3	0	0
	Doctor + Family+ Internet	7	0	0
4	Does following this healthy cooking make you feel happy and satisfied?			
	Yes	545	67	33
	No	58	3	1
5	Do you have your food on time during this COVID -19 outbreak (timing - BF - 8-10am, lunch - 12-2 pm and dinner 7-9 pm)			
	Yes	366	50	27
	No	237	20	7
6	Do you think there has been any change in quality and quantity of your main meal? (breakfast, lunch or dinner)			
	Yes	295	40	18
	No	308	30	16
7	Has there been any change in your weight during this lock down period?			
	Yes increased	203	21	7
	Yes decreased	85	11	5
	No change	178	26	20
	Don't know	137	12	1
8	Are you involved in any physical activity to keep yourself fit during this lockdown period?			
	Yes	299	34	19
	No	304	36	15
9	Did you or any family member start taking health supplements / immunity boosters?			
	Yes	325	33	18
	No	277	37	16
10	Which one of the following do you think helps you as a supplement?			
	Ayurvedic medicines	37	5	5
	Ayurvedic medicines homemade concoctions	13	7	2

	Vitamin supplement	146	15	6
	homemade concoctions	248	30	9
	None	97	6	8
	Ayurvedic medicines Vitamin supplement	9	1	3
	Ayurvedic medicines Vitamin supplement homemade concoctions	14	6	0
	Vitamin supplement homemade concoctions	38	0	1
11	Are you willing to follow these changes in food habits even after COVID -19?			
	Yes	403	50	26
	No	200	20	8
12	Consumption of which food item has increased during this lock down period?			
	Fruits	100	3	5
	Dairy products	27	3	2
	Vegetables	138	7	6
	Eggs	30	1	2
	Meat/Seafoods	37	5	1
	Others	271	51	18

4. Discussion

Our study findings show that the participants adopted changes towards a healthy diet during the COVID-19 pandemic situation in Tamilnadu. A review study by Jayawardena R *et al.*, suggested that balanced nutrition can help in maintaining immunity and also it is essential for prevention and management of viral infections^[8]. Since there is no vaccine and pharmacological cure for COVID-19, people have turned to upgrading the food habits and physical activity to protect themselves. In our study we received a positive response from the participants towards change in their food consumption in order to reach a balanced nutritional diet.

The first section of the questionnaire includes the demographic and diet patterns. The age group of 18-25 showed more interest in filling the questionnaire (Fig 1). The response on diet pattern shows that 61 participants were following vegan diet, 315 participants were following vegetarian diet and 331 participants were Non vegetarians (Fig 2). The age group of people who are more than 40 years of age follow vegetarian diet (47%) when compared to other age groups. Maximum participants following Non vegetarian diet (46.9%) belong to the age group of 18 -25 years.

Of the total participants, 377(53.3%) reported that there was conscious changes in cooking methods to make it healthy. 353 participants reported that the quality and quantity of the food intake has increased during this pandemic situation. There was a maximum response from the age group of 26-40 for both changes in cooking methods (55.7%) and quality and quantity of food intake (57.1%) (Table 1). 443 participants reported that they consume their meals on-time and it is interesting to note that people in the age group above 40 years (79.4%) follow proper timings for the consumption of their meals.

The third section of questionnaire illustrates the changes in the physical activity. It is encouraging that 352 participants were involved in physical activity and 55.8% of the response was found in the age group of >40 years. Gender and age difference was found in performance of physical activities (Fig 4,5). Also it was observed that 33.6% of the participants in the age group of 18-25 years have reported an increase in body weight during this lockdown period (Table 1). A recent questionnaire based study conducted on Italian population during COVID-19 pandemic by Di Renzo, L *et al.*, observed that there was changes in the food habits and physical activities among the people^[9].

Fourth section deals with the intake of health or immune

supplements during this pandemic situation. Data shows that 376 participants consume health supplements and it was seen that 53.8% of respondents of the age group of 18-25 consume some form of health supplements (Table 1). Regarding the type of health supplements 287 individuals consume homemade concoctions as a health supplement and consumption was higher (42.8%) (Fig 6) in the age group of 26-40 when compared to the other age groups (Fig 6a, 6b). A recent population based survey in Spain during this COVID-19 pandemic observed an improvement of the dietary behaviors and health-related food choices which includes higher intake of fruits, vegetables or legumes and lower intake of red meat, alcohol, fried foods or pastries compared to their usual habits during COVID-19 outbreak^[10]. Similarly in our study also there was a significant increase in the consumption of vegetables and fruits by the participants. 400 and 332 participants responded that they consume more of vegetables and fruits along with other foods (Table 1). This shows a positive approach and change in attitude towards healthy living among people of all age groups.

5. Conclusion

Responsibility of an individual is to make an effort to choose a lifestyle which involves healthy cooking, physical activities and maintaining ideal body weight. It is inspiring to observe that people across all age groups are conscious about their cooking methods and are willing to consume homemade concoctions as a health supplement to combat the infections and physical activity has become a part of their daily routine. This indicates more self awareness and acceptance of changes towards a disease-free lifestyle.

6. Acknowledgements: We are thankful to the participants who took part in our study.

7. Financial Support: Nil.

8. Conflict of Interest: None.

9. Authorship Contribution: S. Ramya designed and implemented the study, collected data, undertook statistical analysis, performed data interpretation, and drafted the manuscript. V. Sureka varalakshmi, Chandan Bala.R and M. Nithya participated in data analysis, interpretation and reviewed the manuscript and all authors agree to be accountable for all aspects of the work.

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