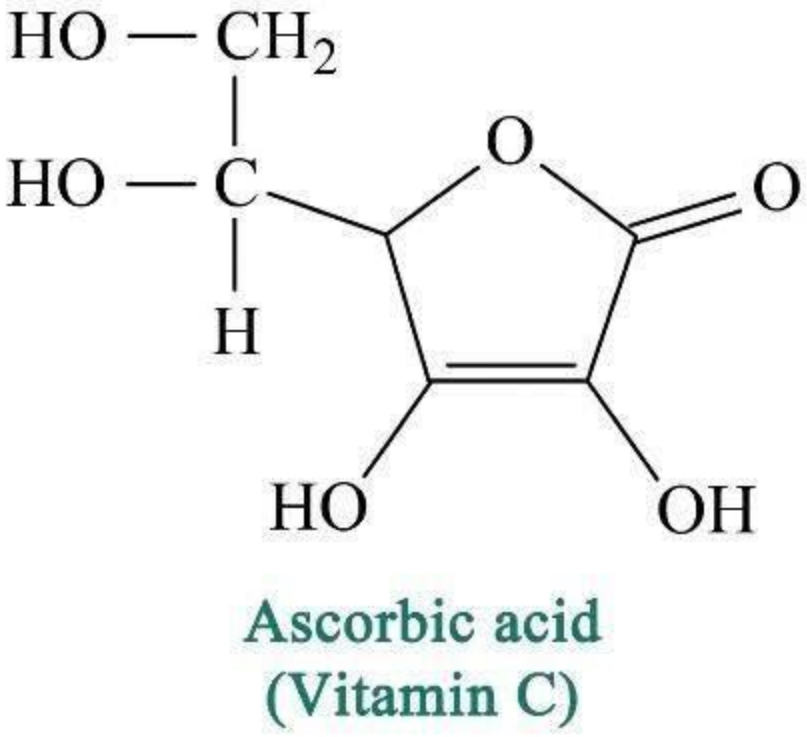
NOVATEUR PUBLICATIONS
INTERNATIONAL JOURNAL OF INNOVATIONS IN ENGINEERING RESEARCH AND TECHNOLOGY [IJIERT]
ISSN: 2394-3696 Website: ijiert.org
VOLUME 7, ISSUE 10, Oct.-2020

EFFECT OF IMPLEMENTATION OF LOCKDOWN ON VITAMIN-C CONSUMPTION PATTERN IN INDIA AMID TWENTY TWENTY'S PANDEMIC: ANALYSIS OF SAMPLE POPULACE PERCEPTION AND PRACTICE BY DESCRIPTIVE ANALYSIS AND WITH GIS CHOROPLETH MAPPING WITH FHL.

Dr. (Er) PARIMITA
Assistant professor
SHUATS

INTRODUCTION

Ascorbic acid (Vitamin C) Occurs as ascorbic acid and dehydro-ascorbic acid too. The second one is extremely heat labile, in or without the company of oxygen. Extremely soluble & easily lost by leaching & in drip losses, also obliterated by number of plant enzymes, including ascorbic acid oxidase, cytochrome oxidase, peroxidase, & phenolase. Copper and iron catalyse oxidation in air, but sulphur dioxide protects against oxidation.[1]



Ascorbic acid
(Vitamin C)

Structural model of Ascorbic acid (vitamin C)

The covid-19 is the crucial mishappening of 2020, The central point for conducting this survey is to find out whether people are aware of the study that ingestion of vitamin C would help them combating the fight against coronavirus 2, their choice of source for the intake of the vitamin C over other i,e natural or supplements and to find out their thoughts on regular uptake of vitamin C even after pandemic is over. The survey was organized online as due to current situation of COVID-19, ground survey was not an option.

Over all the survey was conducted to find out study about the clinical outcome of vitamin C on humans after the intake. We searched, several research works in relation to our survey.

Carr A. and Frei B (1999) Vitamin C has a number of activities that could conceivably contribute to its immune-modulating effects. It is an extremely effective antioxidant, owing to its capability to voluntarily donate electrons, consequently shielding vital bio-molecules (carbohydrates, lipids, nucleic acids and proteins) from damage by free radicals generated in the metabolism period of normal cell and through exposure to toxins & pollutants (e.g. smoke from cigarette) **[17].**

Anitra C. Carr and Silvia Maggini (2017) Vitamin C is an essential nutrient which cannot be synthesized by humans due to loss of a key enzyme in the biosynthetic pathway. Stern deficiency of vitamin C results in the potentially fatal disease scurvy. Scurvy is typified by fragility of collagenous structures, and the outcome is poor wound healing, & impaired immunity. The immune system is a diverse delicate and refined network of specialized organs, tissues, cells, proteins, and chemicals, which has evolved in order to protect the host body from array of pathogens, such as bacteria, fungi, parasites and viruses, as well as cancer cells. It can be segregated into epithelial barriers, cellular & humoral constituents of either innate (non-specific) or acquired (specific) immunity. These components act together in multiple & highly complex modes. Researches of more than half a century of has revealed vitamin C to be a vital player in various aspects of the immune system, predominantly immune cell function.[3]

Maryam mahamoudi and Nima R. (2019) Several studies have demonstrated that there is a good scientific rationale for the role of vitamin C in the regulation of the human immune system. In the addition to its antioxidative effects, vitamin C plays a fundamental role in its immune modulating effects by being a co-factor for several enzymes involved in bio-synthesis and gene expression. This micro-4 nutrient helps to maintain epithelial barrier integrity and promote NK-cell activity and lymphocyte proliferation and differentiation.[8]

Several vitamin C deficiencies have been associated with impairments in immunity and increase susceptibility to more infections, while vitamin C supplementation seems helpful to prevent and treat infection. Supplementation with vitamin C especially in groups such as the elderly has been shown to reduce the duration and severity of cold symptoms by enhancing various immune cells functions. Ensuring sufficient vitamin C labels may be particularly an essential factor in conditions involving an additional change in the immune system such as inflammation, autoimmunity and cancer.[8]

Table 1 - Role of vitamin C in immune defense [3]

Immune System	**Function of Vitamin C**
Epithelial barriers	Enhances collagen synthesis and stabilization
	Protects against ROS-induced damage
	Enhances keratinocyte differentiation and lipid synthesis
	Enhances fibroblast proliferation and migration
	Shortens time to wound healing in patients
Phagocytes (neutrophils, macrophages)	Acts as an antioxidant/electron donor
	Enhances motility/chemotaxis
	Enhances phagocytosis and ROS generation
	Enhances microbial killing
	Facilitates apoptosis and clearance
	Decreases necrosis/NETosis
B- and T-lymphocytes	Enhances differentiation and proliferation
	Enhances antibody levels
Inflammatory mediators	Modulates cytokine production
	Decreases histamine levels

Note: many of above mentioned researches comprised marginal or deficient vitamin C status at baseline. Giving supplements in situations of sufficient vitamin C status may not have analogous effects.

JUSTIFICATION

Vitamin C plays a vital role in immune defense system by supporting a variety of cellular functions of both the innate & adaptive immune system. Vitamin C also give supports to epithelial barrier function in combating pathogens & promotes the free radical scavenging activity of the skin, Vitamin C accumulates in phagocytic cells, such as neutrophils, & can enhance chemotaxis, phagocytosis, generation of reactive oxygen species, & ultimately microbial killing.[2]

This study focuses on the usage of vitamin C as an immnuo-booster. Micro nutrients and people's perception it's as an alternative to increase their immunity level. At this time where a disease (COVID-19) is turning into a pandemic and there is no such cure available, the only protecting mechanism against it to boost or build proficient immune system, here in this case the immunity enhancing effect of vitamin C can comes in handy.

OBJECTIVE

The survey is designed by keeping some objective in mind these objectives are

• To create awareness and passing on the proofed knowledge on the immunity enhancing effects of vitamin C especially in this pandemic situation.

• To find out people uptake of vitamin C in their daily diet on various basis.

• To check whether or not they have any sort of allergies or side effects on taking vitamin C supplements.

• To note people preference when they have choice between natural and synthetic method of intake of vitamin C.

MATERIALS AND METHODOLOGY

• DECISION OF RESEARCH GOALS

The sole purpose of this survey is providing the consciousness amongst population on the immunity building effects of vitamin c. this survey will let us know the perception of the population regarding the use of food items as a medicine or cure. It will provide the base for many future research and analysis based on the interest and preference of the masses. By applying the information acquired by the survey it would be easier to develop a project which is purely based on the demand and choices of the individual belongs to particular section of society yet there will be systemic approach by the means of this survey. This survey also provides information and reason behind the scarcity of certain nutrient in a particular demographic population and also helps to suggest them other healthy consumable alternative which can fulfill their nutritive requirement with equal or more nutritive value.

• PREPARATION OF THE QUESTIONARE FOR THE SURVEY

By keeping above research goal in mind we prepare a survey which contains all the aspects and aim of our research.

• INVITATION TO THE PARTICPANTS

By applying a logistical approach and aiming the interest of the participants we invited them to take a part in a quick and knowledgeable survey.

• GATHERING OF INFORMATION AND ANALYSIS OF RESULT

The responses of the participants were collected in an organized manner which makes its analysis easier and more conveyable and the responses were sorted on some basis: age, region etc. and studied thoroughly to find out possible outcomes. One the basis of acquired outcomes report was prepared.

FINDINGS

Gender of the participants

In this survey, majority of participant were male i.e, 61.9% followed by female (38.1%).

Residing state of the participants

The majority of the participants belongs to the uttar Pradesh (52.6%), followed by Bihar (32.8%). The third majority is from delhi (6.9%) and the minority belongs to gujarat (1.7%) and Karnataka (1.09%) By this question we get to know that which state people consume and prefer which form of vitamin-c and what is the effect of lockdown on their vit-c consumption habit.

Age group of the participants

As clear in the graph, the majority of the participants were between 15-30 year.

Participant's highest degree of education

Around 59.3% of total participants gave completed high school i,e. majority and 38.1% of the total participants have completed bachelors degree. The remaining have completed masters degree.

Participant's marital status

As clear in the graph, the majority of participants are unmarried around 97.5%.

Participant's annual household income

31.9% of the participants have annual income of more than 200000 rupees, whereas 28.4% of total participants have less than 100000 rupees and 19.8% have less than 25000 and 50000 rupees each respectively.

Participant's current employment status

71.3% of total participants are seeking for job opportunities followed by the one who are full time employed (17.4%), and then remaining 7.8% are part time employed.

Number of family members of the participants

49.2% have family members 2-4 and 48.3% have family members more than 4.

Knowledge of the participant regarding immunity playing a role to fight against the pandemic

The majority i,e (84.7%) believes that boosting immunity is an effective way fight against COVID-19 coronavirus, whereas as 2.5% people denied it. 9.3% of the total participants were not sure about this claim.

People's knowledge that vitamin C is best immunity booster

69.5% i,e majority of participants knows and supports that vitamin C is best for boosting immunity. 5.9% don't think it is as correct nor did they support it. Remaining just supports the idea but was not sure (12.7%) or simply were not sure (11.9%).

People's interest in consuming vitamin C supplement

Majority of people, i,e (42.4%) do not take any sort of vitamin C supplements, which means they depend on daily diet for the uptake of vitamin C. 39% people takes vitamin C supplements. While 14.4% people were not sure whether they have taken vitamin C supplements in past or whether they will take in future or not.

Participant's daily uptake of vitamin C supplement

Those who claimed, that they take vitamin C supplement are divided in three categories: those who take vitamin supplements daily (12.9%), those who take once in a week (17.2%), and those who were not sure about their uptake (34.5%). While 35.3% don't consume.

Any kind of side effects occurring while taking artificial vitamin C supplements

Majority (47.5%) denied about having any kind of side effects of taking artificial vitamin supplements. 33.9% people never noticed any kind of side effects, 13.6% claim to have it sometimes while 5.1% (minority) claims it to be showing some side effects.

People's concern regarding taking vitamin c artificial supplements

34.2% people show their concern on uptake of artificial vitamin C supplements. 26.5% does not show any concern. 12% and 27.4% are not sure and don't have knowledge about it.

Participants view on immunity booster uptake even after pandemic

Majority of participants i,e (57.6%) says they will continue to take immunity booster even after pandemic, 11% denied.

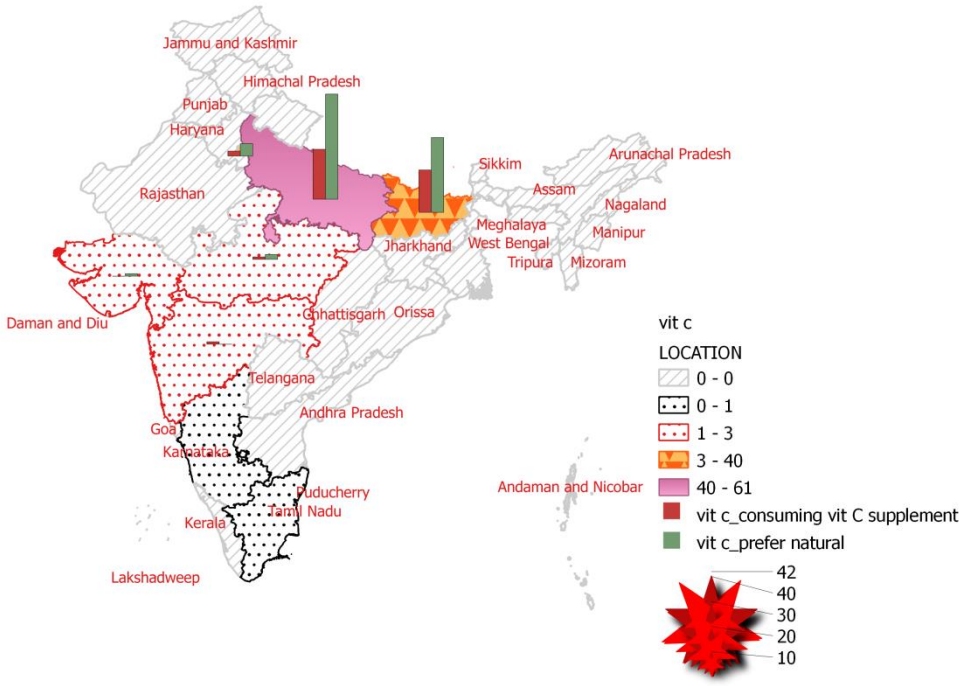


Figure: 1: Choropleth Map: showing home states of respondents and frequency histogram legand for answers to the questions "wheather the sample populace is consuming vitamin-C supplements & how much populace prefer to take natural form of vitamin-C during the implementation of lockdown**"**

GIS Choropleth mapping with FHL:- As we can clearly state from choropleth map that majority of respondents belong to U.P. & Bihar. As can be observed in the vit-c in natural form is preferred in comparison to supplements during lockdown imposed to combat covid-19.

CONCLUSION

While studying and analyzing the survey we find out some new point on vitamin C's role as immunity booster and here are the conclusion we draw from the survey.

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

In the luminosity of this central fact socio-demographic profile of the respondents of this research is pertinent as most of the respondents belong to same socio-demographic profile i.e.

Majority of the participants belongs to the states of Uttar Pradesh, Bihar and New Delhi, the gender of the majority participants were 15-30 year old male. The highest levels of education of majority of the participants were high school graduation, followed by undergraduate as a 2nd highest level of education. The majority of participants were unmarried (97.5%). The annual household income of the 31.9% of the total participants were more than 4 lakhs, 28.4% of total participants have annual income less than 1 lakh, around 19.8% of participants have annual income less than 50,000 and 25000 rs. each respectively. The majority of participants were seeking for job opportunities (71.3%) followed by 17.4% of total participants as fully employed. Around 49.2% of total participants have 2-4 family members and 48.3% of total participants have more than 4 family members.The statistics shows that majority was well known about the fact the one can prevent himself from COVID-19 by boosting his/her immunity. About 29.7% (maximum participants) ranks their immunity level as more than average. The majority did have the knowledge about vitamin C being a best micronutrient for enhancing the immunity. Maximum people do not take vitamin C supplements apart from uptake in daily diet, still a convincible percentage (42.4%) take vitamin C supplements. Happily maximum number of participants (80.5%) claimed they were neither allergic nor showed any symptoms or side effects (47.5%) while uptake of vitamin C. those who were allergic shows symptoms such as gum bleeding (3.4%), skin problem (11.1%), anemia (2.6%). Not surprisingly majority of people (68.1%) prefer natural supplements for taking vitamin C remaining 11.2% do take it as capsule base while 19% do not take any type of supplements at all.

Result outcomes were more than satisfying when majority (57.6%) promotes as well as implement the idea to take vitamin C even after pandemic is over

RECOMMENDATIONS

It would be recommended to take this research to the level next with more advance level of inferential analysis. COVID-19 outbreak can provide the opportunity after the crisis and finding efficient treatments/vaccines, to make mid-term and long-term improvements in boosting the habit of populace to consume vitamin-c in natural form in their daily routine.

REFERENCES

1) Retrieved at 31/05/2020 "food processing technology p j fellows pdf"https://books.google.co.in/books?hl=en&lr=&id=t4ykAgAAQBAJ&oi=fnd&pg=PP1&dq=food+processing+technology+p+j+fellows+pdf&ots=xftnnCisVU&sig=vs-

m96VtParhfST81QUjC404vIM#v=onepage&q=food%20processing%20technology%20p%20j%20fellows%20pdf&f=false

2) Retrieved at 31/05/2020 "Vitamin C and Immune Function" Anitra C Carr 1 , Silvia Maggini https://pubmed.ncbi.nlm.nih.gov/29099763/
3) Retrieved at 2-06-2020-"Vitamin C and Immune Function" Anitra C Carr 1 , Silvia Maggini https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5707683/
4) Retrieved at 2-06-2020 "Parkin J., Cohen B. An overview of the immune system". Lancet. 2001;357:1777–1789. doi: 10.1016/S0140-6736(00)04904-7. [PubMed] [CrossRef] [Google Scholar]
5) Retrieved at 2-06-2020 "Maggini S., Wintergerst E.S., Beveridge S., Hornig D.H. Selected vitamins and trace elements support immune function by strengthening epithelial barriers and cellular and humoral immune responses" [PubMed] [CrossRef] [Google Scholar]
6) Retrieved at 2-06-2020 "Webb A.L., Villamor E. Update: Effects of antioxidant and non-antioxidant vitamin supplementation on immune function." https://pubmed.ncbi.nlm.nih.gov/17566547/
7) Retrieved at 2-06-2020-"nutrition and immunity" https://books. google.co.in/ books?id=_ l2mDwAAQBAJ&printsec=frontcover&dq=vitamin+c+and+immunity&hl=en&sa=X&ved=0ahUKEwiA8_D59uTpAhUwlEsFHdx7ATYQ6AEIMjAB#v=onepage&q=vitamin%20c%20and%20immunity&f=false
8) Retrieved at 2-06-2020 "Carr A., Frei B. Does vitamin C act as a pro-oxidant under physiological conditions?" https://www.fasebj.org/doi/full/10.1096/fasebj.13.9.1007.